THE EFFECTS OF A SPELLING WORD STUDY STRATEGY ON THE SPELLING PERFORMANCE OF HIGH SCHOOL STUDENTS WITH LEARNING DISABILITIES

BY

BEVERLY OVIATT BROWN

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Beverly Oviatt Brown

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Students with learning disabilities exhibit problems in many academic areas; frequently these problems are evident in the written products of these students. Among the many problems that occur for students with learning disabilities in written expression, spelling problems remain the most prominent. Spelling skill is complex, requiring the speller to (a) have knowledge of language mechanics, (b) make visual associations, and (c) have an internalized understanding of semantic rules. As a result of these complexities, spelling remains a problem for many individuals with learning disabilities thoughout their lives. The societal importance placed upon correct spelling and the lack of spelling instruction at the secondary level only serve to magnify the problem.

A word study strategy was developed including direct and mnemonic instruction for teaching students with learning disabilities a strategy for studying spelling words. This strategy was taught to 10 students with learning disabilities who exhibit deficits in spelling as measured by *The Test of Written Spelling-3* (Larsen & Hammill, 1986). The dependent variables investigated were the percentage of words spelled correctly after using the study strategy, the number of words written daily during seven minutes of free writing, and the number of target words, those words appearing on the weekly spelling test that were found spelled correctly in the daily free writing samples.

A single subject design was used to enable the researcher to make comparisons of data collected prior to, during, and following the intervention. Analysis of this data revealed that students were able to acquire and apply the spelling strategy. Improvement occurred in the dictation test scores following training in the strategy. The number of words written during the daily free writing trials did not change significantly following the intervention. Generalization of spelling words occurred following the presentation of words to study that had been misspelled in previous free writing probes.

Limitations of this study such as sample size and geographic location are discussed. Implications for the classroom and additional research are outlined. Suggestions for further studies are presented.

CHAPTER I
INTRODUCTION TO THE PROBLEM

The purpose of Chapter 1 is to acquaint the reader with issues critical to the present study and to provide a rationale for the study. In this section, the primary trends in spelling research are highlighted, the problems with dissemination of this research are discussed, the unique problems associated with teaching spelling at the secondary level are presented, and the research as it applies to students with mild disabilities is analyzed.

Spelling Research

Our Querr Lingo

When the English Tongue we speak
Why is "break" not rimed with "freak"?
Will you tell me why it's true
We say, "sew," but likewise "few"?
And the maker of the verse
Cannot rime his "horse" with worse"?
"Beard" sounds not the same as "heard";
"Cord" is different from "word";
"Cow" is cow but "low" is low;
"Shoe" is never rimed with "foe"
Think of "hose" and "dose" and "lose";
and think of "goose": and yet of "choose."
Think of "comb" and "tomb" and "bomb,"
"Doll" and "roll" and "home" and "some"
And since "pay" is rimed with "say"
Why not "paid" with "said", I pray?
Think of "blood" and "food" and "good";
"Mould" is not pronounced like "could."
Wherefore "done," but "gone" and "lone"-
Is there any reason known?
To sum all, it seems to me
Sounds and letters don't agree.
-Anonymous (Tindall & Marston, 1990, p.180)

This poem accurately identifies one of the primary problems associated with English spelling: English contains many rules for assigning sound to symbol, but many exceptions exist for each rule. In addition to an internalized sense of rules, the speller must also be able to make visual associations and have language knowledge. The good speller must possess knowledge of all of these skills. These complexities associated with spelling ability have given rise to two distinct theoretical positions in spelling research.

Theories Underlying Spelling Research

Among the numerous studies conducted in spelling research, two primary theoretical stances have emerged. One faction maintains that English is primarily irregular. Advocates of this theoretical position propose creation of a synthetic, highly phonetic alphabet, or teaching each word as a whole word.

The desire to create a synthetic alphabet grew from a desire to make English phonetically regular. The Initial Teaching Alphabet (Downing, 1967) was developed in the 1950's to fill this need. Although a number of studies were conducted that established the effectiveness of this method, the impracticality of reprinting already published materials prevented its fruition.

Researchers have determined that visual memory plays a significant role in spelling ability (Peters,1985), and that good spellers see the word as a whole, not divided into syllables or letter by letter (Hartman, 1931). Theorists who have concentrated their research based on these findings investigated the teaching of spelling words as a whole word as compared to dividing words into syllables or teaching words letter by letter. The use of whole words in spelling is an effective technique (Fitzsimmons & Loomer, 1978; Horn, 1947; Gilbert & Gilbert, 1942).

Other researchers claim English is patterned but incomplete. These researchers propose teaching spelling phonetically, or teaching rules to improve spelling performance. The argument underlying this position is that certain consistencies exist in English spelling. In an extensive study conducted at Stanford University using computers programmed to spell 17,000 words, Hanna, Hodges, and Hanna (1971) found that 50% of English words can be spelled phonetically. Although some spelling can be accomplished with knowledge of phonics, it remains highly improbable that knowledge of phonics will produce lexical spellings.

Instruction in spelling rules to improve spelling performance has been investigated (Allred, 1977; Darch & Simpson, 1990; Fitzsimmons & Loomer, 1978). The consensus of researchers suggests that only a few rules should be taught when there is a need, and only those which have few exceptions should be taught.

Effective Techniques

Out of the profusion of research on spelling have emerged a number of techniques that are deemed effective (Fitzsimmons & Loomer, 1982; Gordon, Vaughn, & Schumm, 1993). Techniques reported as effective are determining readiness (Allred, 1977; Nicholson & Schacter, 1980; Peters, 1985), using finite word lists (Ayers, 1950; Fitzgerald, 1951; Horn, 1926), testing students on the target words prior to instruction (Horn, 1947; Horn, 1976), analyzing errors (Ganschow, 1984; Nelson, 1980; Silva & Yarborough, 1990), training in study strategies (Fernald, 1943; Fitzgerald, 1951; Horn, 1954; Westerman, 1971), and instruction in spelling rules (Horn, 1960; Templeton, 1980). Effective techniques for teaching spelling do not seem to be the problem. Fitzsimmons and Loomer (1978) speak to this issue stating: "Historically, spelling has been one of the most frequently investigated areas of the curriculum. However, improvement in spelling programs does not seem commensurate with research efforts." (p. 61)

Another problem exists in the lack of research conducted with students who have learning disabilities. Most of the spelling research has been conducted with general education students (Vallecorsa, Zigmond, & Henderson, 1985).

The emphasis on spelling research stems from the societal importance placed on correct spelling. Poor spelling is attributed to (a) poor communication, (b) being discourteous (like mumbling in conversation), (c) poor self-concept, (d) writing simply or simply not writing (Peters, 1985). Templeton (1992) goes so far as to describe spelling as "the bedrock of literacy, the barometer of intelligence, and the measure of our schools successes" (p. 454)

Spelling at the Secondary Level

A number of deterrents to good spelling exist at the secondary level. First, spelling is a skill commonly associated with elementary school (Silva & Yarborough, 1990). Secondly, most high school teachers do not expect to teach spelling, nor have they been trained to do so. Meanwhile, spelling is a deterrent to effective writing for one in ten secondary students. One would assume, with the societal importance placed on correct spelling, that spelling instruction would play an important part of the writing curriculum.

Spelling deficiencies aren't commonly described, explained, or remediated at the secondary level (Gordon et al., 1993). Students who exhibit these problems are primarily considered careless or indifferent. Spelling disabilities stifle those who may be imaginative writers; the anguish experienced in trying to form words correctly cancels out the creative process. "At its worst, a history of spelling problems may have developed such deep resentment against writing as to deter a student from generating written materials of any type" (Silva & Yarborough, 1990, p. 48)

Spelling and Individuals with Mild Disabilities

Spelling difficulties are common within the population of individuals with mild disabilities (Carpenter & Miller, 1985; Vallcorsa, Zigmond, & Henderson, 1985). Graham and Miller (1979) claim the majority of children who are labeled exhibit spelling problems. These authors claim these spelling problems can be attributed to (a) inadequate classroom instruction, (b) poorly designed commercial materials, and (c) the absence of research based instruction. Spelling has frequently been identified as being a problem for students with learning disabilities. Gerber and Hall (1987) describe spelling problems as a common diagnostic characteristic of learning disabilities, reading disabilities, and dyslexia. Not only common among students with learning disabilities, spelling remains difficult to remediate (Demaster, Crossland, & Hasselbring, 1986). Deshler, Schumaker, Alley, Warner, and Clark (1982) have found problems with spelling to be the factor differentiating students with learning disabilities from those identified as low achieving. Spelling deficiencies remain a problem for individuals with learning disabilities into adulthood. Adults with learning disabilities indicate deficiencies in spelling are of primary concern. These individuals fear that problems with spelling will hinder employment opportunities (Hoffman, Sheldon, Minksoff, Sautter, Steidle, Baker, Bailey, & Echols, 1987; Johnson & Blalock, 1987).

Even though spelling is identified as a significant problem for individuals with learning disabilities, a dearth of research investigating the problem is found. Summers (1986) reviewed research of 2,270 articles that investigated written expression and subjects with learning disabilities from 1968 to 1983. He found that only one percent of these articles addressed the area of spelling.

A review of the literature revealed 36 articles published after 1977 that reported on the effectiveness of a variety of spelling interventions used with subjects who have learning disabilities. The independent variables in these studies can be categorized as (a) strategy instruction, (b) modality specific instruction, (c) peer tutoring, (d) computer assisted instruction, (e) error analysis, or (f) a combination of procedures (see Chapter 2). The majority of these studies compared the above-named interventions with traditional instructional methods or baseline data.

Statement of the Problem

The problem investigated in this study was the effectiveness of teaching a spelling strategy to high school students with learning disabilities. The experimental questions were as follows:

1. Will training in SPELL, the word study strategy, increase the percentage of words spelled correctly on the weekly spelling test?

2. Will training in SPELL,the word study strategy, increase the number of words written during seven minutes of free writing?

3. Will training in SPELL, the word study strategy,increase the number of target words, words that students have been tested over, spelled correctly in the seven minute writing samples?

The problem examined in this study is important for several reasons. First, the means to teach spelling have been identified in the research literature but have been poorly disseminated. Secondly, the need to teach spelling at the secondary level is apparent because of the spelling problems demonstrated by students at this level, and the need to remediate these problems. And lastly, students with learning disabilities exhibit special needs in the area of spelling instruction. The inability to spell inhibits written expression.

Rationale of the Study

Because of the numerous spelling difficulties of secondary students with learning disabilities, spelling instruction is essential at the secondary level. Many effective instructional techniques have been identified throughout the decades of spelling research. These techniques need only to be packaged in a format that can be easily incorporated in the composition instruction that is carried out at the high school level.

This researcher hypothesized that once daily spelling instruction occurs at this level with students who have learning disabilities, not only will the spelling of these subjects improve as measured by weekly dictation tests, but the timed writing assignments will also increase in length due to increased confidence in spelling ability. Generalization of the target words to writing samples will also occur.

Definition of Terms

Terms used in this study and their definitions are presented in the following sections. Understanding of these terms is critical to understanding the implementation procedures and the observed results.

Affix refers to a morpheme dependent upon another morpheme (Blake & Emans, 1970).

A grapheme is an alphabetical symbol representing a phoneme (Blake & Emans,1970).

Linguistics is the study of human speech including phonetics and word meanings (Blake & Emans,1970).

A morpheme is the smallest meaningful unit in the structure of words (Blake & Emans,1970).

Orthography is the art of writing words with the proper letters according to standard usage.

A phoneme is a group of phonetically similar sounds (Blake & Emans,1970).

Phonetic Analysis involves the use of phonics in the spelling of words (Blake & Emans,1970).

Phonetics is the science of speech sounds (Blake & Emans, 1970).

Phonics refers to the application of phonetics to spelling and reading (Blake & Emans, 1970).

A Schwa is a vowel sound in an unaccented syllable (Blake & Emans, 1970).

Spelling is defined as the ability to recognize, recall, reproduce, or obtain orally or in written form the correct sequence of letters in words (Graham & Miller, 1979).

Structural Analysis employs the use of meaning units in the recognition of words (Blake & Emans, 1970).

A Syllable is a unit of sound composed of a vowel and often a consonant (Blake & Emans, 1970).

Delimitations of the Study

This study was delimited by geographical restrictions to Camden County, Georgia, a rural county located in the most southeastern corner of the state. The subjects were all high school students identified as having a learning disability in a language related area.

Limitations of the Study

Because this study included only high school students, the findings should not be generalized to elementary or middle school students. In addition, the findings cannot be generalized to other language arts skills. Caution should also be taken in generalizing the results beyond Camden County, Georgia.

Summary

Research in teaching spelling to secondary students with learning disabilities is clearly needed. The intent of this study was to advance the knowledge of effective instruction in spelling at the secondary level. Results of this study have implications for both regular and special education teachers of language arts at the secondary level.

Chapter II presents a review of the research literature relevant to this study. Chapter III describes the methodology used in the implementation of this study.

CHAPTER II
REVIEW OF RELATED LITERATURE

Introduction

The purpose of this chapter is to summarize and analyze spelling research involving students with learning disabilities. First, the historical development of spelling research is briefly discussed. Secondly, the theoretical development of spelling instruction is presented and critiqued. Then, an examination of effective spelling interventions for students with learning disabilities is conducted, followed by research in effective teaching techniques. Finally, a summary of the chapter and the relevance to this investigation are presented.

Historical Development

Over the past twenty-five centuries, the English language has gone through a multitude of changes, from the writing of Old English in 600 BC to its modern conceptualization as we now know it. Old English was derived from Latin and Greek and first recorded in monasteries. Because it was characterized by a high phoneme-grapheme correspondence, it was a phonetically regular language. As with Latin and Greek, inflectional endings were used to indicate syntactical relationship (Henderson, 1981).

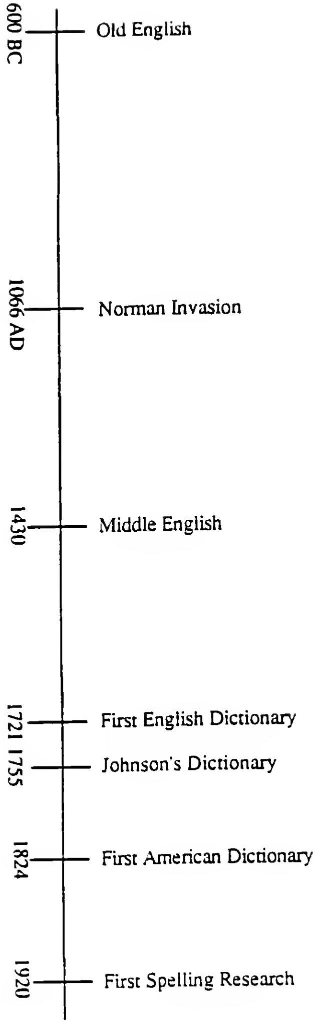


Figure 1. Timeline of English spelling development.

With the Norman invasion of England in 1066 AD, the structure of Old English began to change. At this time French became the language of the court, and English was not restored until 1430. During this period many changes occurred; for example, inflectional endings were replaced with word order in the sentence to indicate syntax. As much as 40% of the vocabulary was borrowed from the Anglo-Normans. The language during this time is referred to as Middle English.

Henderson (1981) eloquently describes the period of Middle English as seeming rather like:

> A great pot of 100-year soup on the back burner of a rural stove. The ancient stock persisted, and it combined and blended in interesting and agreeable ways, while the weekly lacing of French wine continually added piquancy, a certain elegance, and a new power. The basic stuff was English, the high frequency words of the grammar, to these, French terms of court, law, religion, and war were added. (p. 27)

Out of this large medieval pot poured a number of complexities for English spelling. One of the major changes from Old to Middle English was the Great Vowel Shift. This was characterized by the pronunciation of long vowels. Further molding the English language was the adoption of vocabularies of philosophy, science, and art. The first English dictionary was not available until Bailey printed it in 1721. In 1755, Johnson's dictionary became the printer's standard. The first American dictionary was not published until 1824.

Spelling research began in the early 1900s, with the publication of a large number of descriptive studies in the 1920's. These studies featured data about children's errors. Interventions to remediate errors were not developed until several decades later. Since the 1920's, spelling has been frequently researched, and, from this plethora of research, two separate schools of theoretical thought emerged.

Theoretical Development

Spelling is a complex skill that requires the speller to use language knowledge, visual associations, and internalized rules (Nicholson & Schacter, 1979). Because of the cognitive complexities associated with learning to spell, a number of researchers have attempted to investigate the degree to which language knowledge, visual associations, and internalized rules play a part in spelling ability. As a result of these investigations, two theoretical view points have developed.

One theoretical viewpoint maintains that English orthography is irrational and difficult to master. Proponents of this theory developed the initial teaching alphabet (i.t.a.) and the whole word approach. The opposing theorists propose that English orthography is patterned but incomplete. Proponents of this theoretical stance advocate a phonic approach to spelling instruction, or rule-based instruction. Each of these positions will be presented and critiqued.

English Orthography Is Irrational

Reseachers who maintain that English orthography is irrational state that English is a language confounded by the integration of many other languages and is therefore not phonetically regular. Due to this lack of phonemic regularity, these reseachers claim that there needs to be an establishment of a purely phonetic alphabet, or that spelling words must be tackled as whole words (visually).

Synthetic alphabet. The Initial Teaching Alphabet (i.t.a.), developed in the 1950's, was an attempt to make the English language regular. English, with its 44 phonemes and 26 letters makes spelling a complex task. A word such as "circumference" can be spelled phonemically 288 ways (Allred, 1977). The i.t.a., developed by James Pitman, was never intended as a total reform, but was designed as a stage in the teaching of reading and spelling. The i.t.a. attempted to regularize English spelling by reducing the number of alternative or redundant symbols in our writing system (Downing, 1967). Students were expected to learn to read using i.t.a. and then to transfer their knowledge to traditional orthography.

The first experiments conducted to determine the effectiveness of i.t.a. were field experiments, experiments that were conducted in the field with a lack of experimental control. Groups were not randomized. The second group of experiments spanned three years and involved 873 experimental subjects and 873 control subjects. The control group outperformed the experimental group in spelling achievement.

Petty, Murphy, and Mohan (1974) conducted a comparison of the number and types of spelling errors made by those taught using a synthetic alphabet with errors made by those taught with reading materials using traditional orthography. The purpose was to determine if misspellings of i.t.a. subjects were more rational; rational misspellings were those that were related to sound symbol generalization. Five hundred and seventy-three subjects participated, and 323 were taught using i.t.a., while 250 were instructed in traditional orthography. All students were administered a test of 50 words. Twenty-five were third-grade difficulty, while 25 were of fourth-grade difficulty. The researchers found no significant differences in the spelling achievement of the two groups.

Block (1972) reviewed forty-seven studies which compared the spelling of children taught using i.t.a. with those taught using traditional orthography. Twenty-one studies involved first grade students. Six found traditional orthography to be more effective, six found i.t.a. to be more effective, and six reported no difference. Seven of these studies divided first grade students into subgroups;

subgroups were formed by dividing the experimental group to deliver different measures. Of these studies, four indicated i.t.a. was the better method, and three found no difference.

Block (1972) reviewed eighteen studies involving second-grade students. No difference between i.t.a. and traditional orthography was found in five of these studies. I.t.a. was found to be more effective in eleven studies. Subgroups were randomly identified in three of the eighteen studies, in order to test using a variety of measures. The Initial Teaching Alphabet was superior to traditional orthography in these three studies. Results indicate a tendency for i.t.a. subjects to spell better.

Advantages to using the i.t.a. include swift and early decoding ability. Children taught i.t.a. spelled as well or better than those schooled in traditional orthography (Peters, 1985). Problems with i.t.a. include a slowing down of the reading process (Frith, 1980). Not only is i.t.a. more cumbersome, but as a spelling reform it is implausible. Using i.t.a. would require a reprinting of all published materials, which is not economically possible. It would also require an additional step in the instruction process. Transition from traditional orthography to a synthetic alphabet, although in some cases possibly more effective, is not practical (Peters, 1985).

Whole word approach. Theorists who have conducted spelling research have determined that "good spellers" are able to picture the word in their heads. Good spellers are able to see the word as a whole better than poor spellers (Hartman, 1931). Visual memory plays a significant role in spelling ability (Peters, 1985). Theorists who support the hypothesis that English is irrational and difficult to master have proposed that the teaching of spelling words as whole words to be memorized is superior to the teaching of phonemic segmentation or syllabication.

Investigations of the presentation of spelling words as a whole word have been popular for decades. Gilbert and Gilbert (1942), using a tachtiscope to determine the eye fixations of twenty-three upperclass college students who were superior spellers, found that good spellers make fewer and shorter fixations than poor spellers. They are able to see more of the word at a time and make fewer regressive movements.

Hartman (1931) tried to determine if visual or auditory abilities were responsible for spelling achievement. A spelling battery was administered to 63 college students who had been determined to fall in three groups of low ability, average ability, and high ability spellers. The eight tests that were administered were: perceptual span for meaningful material, visual recognition, silent reading, hidden word identification, letter digit substitution code, auditory memory, pronunciation, and auditory recognition. Statistical comparison of the test results indicated that only one of the tests correlated with spelling ability, the test of perceptual span for meaningful visual stimuli.

Other researchers have investigated the presentation of words as a whole as compared with syllabication of the words presented. Horn (1947) undertook an investigation to determine the effect of visual presentation of words by syllables on learning to spell. He concluded that no advantage to syllabication existed across ability levels. On the contrary, there appeared to be a disadvantage, in that presentation by syllable contributed to error.

Proponents of the whole word approach (Horn, 1926; Horn, 1947, Fitzgerald, 1951; Fitzsimmons & Loomer, 1980) argue that the number of words that are necessary to write effectively are finite. Horn (1926) studied samples of children's writing and determined that 2,800 to 3,000 words make up ninety-seven percent of the words that are used. These researchers argue that this is a manageable list to be learned.

Conclusions

Researchers claiming English orthography irregular propose the formation of a synthetic, highly phonetic alphabet, or the teaching of spelling as a list of necessary words. The findings of these researchers are varied. Research involving the i.t.a. has demonstrated positive results; twenty of the forty-nine studies reported i.t.a. superior to traditional orthography. The practice of republishing materials, and the additional instructional steps that are required make this method impractical. The whole word approach, although effective with some students, can be prohibitive for students with memory deficits (Peters, 1985).

English Orthography is Patterned but Incomplete

There exists a group of theorists opposing the stance that English orthography is irrational. These researchers assert that certain consistencies exist in English spelling (traditional orthography). Proponents of this theoretical position promote two distinct disciplines, those who advocate phonetic training to improve spelling, and those who support rule-based instruction. Research in both areas will be presented.

Phonics. Venezky (1967) surmises that the earliest writing on English orthography derived from the fourth to the sixth century Roman grammarians. At this time each letter had a name (nomem), appearance (figura) and a power or sound (potestas). He claims that little work has been carried out by linguists to examine phoneme grapheme awareness among research subjects; instead, many attempts at understanding the relationship have been targeted toward reform, assuming that an alphabet should be "perfectly phonetic" (p. 78).

One of the more extensive studies conducted to determine the effect of phoneme and grapheme position on spelling was conducted at Stanford. Hanna, Hodges, and Hanna (1971) wanted to answer the following questions: (a) how phonemes are spelled when position and stress have no effect on them (eg. in the word t-o-p the position of each letter has no effect on its pronunciation), (b) how the position of a phoneme effects its spelling (eg. in the words f-a-r-m and s-p-h-e-r-e the f phoneme is spelled differently; f-farm, f-sphere), and (c) how syllable or word stress (accent) affect phoneme-grapheme correspondence. Hanna et al. (1971) assert "an ability to spell correctly in our language is largely dependent on the person's knowledge of how closely a given phoneme approximates the alphabetic principle of a unique graphic symbol for each phoneme" (p. 80)

Stanford researchers employed computer technology on 17,000 words to clarify the alphabetic nature of American-English spellings. The findings were as follows: (a) for phoneme-grapheme correspondences most consonants have a single spelling, while for vowels eighty percent or more are far less predictable and (b) when factor or position of the vowel in the word are considered, vowels are far more predictable.

The Stanford group conducted a second investigation. The computer was programmed to spell 17,000 words using input from the first study. The results were as follows: the computer spelled fifty percent of the words correctly. Thirty-seven percent were spelled with only one error. Eleven percent (11.4) were spelled with two errors, and two percent (2.3) were spelled with three or more errors.

Hanna and Moore (1953) analyzed 3,000 words. They concluded that eighty percent of the phonemes could be represented by the same letter or letters in more than half of the occurrences of these phonemes in words. Horn (1957) argues that these findings are moot because of pronunciation variability across dialects. From a list of 10,000 words, one-third have varied pronunciations. What is regular for one speaker is irregular for another.

Venezky (1967) applied morphonemic theory to a body of 20,000 English words to generate rules to ascertain spelling to sound correspondence, in an attempt to make patterns in English appear regular. Venezky (1967) proposed a four stage process: (a) divide the word into meaningful units; (b) map phonemic representation on a one to one basis; (c) apply syntactic, semantic, and phonological rules; and (d) realize a phonetic form of the word.

Many studies have been conducted to support or refute the phonetic theory. Valmont (1972) found those able to determine if a word is misspelled have superior phonetic awareness. Tovey (1978) wanted to determine the appropriateness of teaching children to sound out spelling words. He analyzed the stories of first graders. Of the 619 misspelled words, fifty-three percent were phonetically correct. Tovey (1978) maintains that although many of the spellings were "ingenious" they were inaccurate all the same.

It appears that problems with teaching spelling phonetically include the following: (a) there are many ways a given sound can be represented, (b) writers are dependent on the knowledge of visual features of a word and the way they pattern in the language, and (c) it remains highly improbable that sounding out words will produce lexical spellings.

Gillingham and Stillman (1936) who identified the "strepho symbolic" individual, one who cannot see with a clear visual image, stated that phonic instruction of spelling is a necessity. Peters (1985) identified problems with phonic instruction. First, most sounds can be spelled many ways. Secondly, most letters spell many sounds. More than one-third of the words in the dictionary have more than one acceptable spelling. One-half of the words contain silent letters and or doubled letters. Moreover, intensive phonic instruction is not superior to non-phonic instruction (Beddell & Nelson, 1954) Few children understand word attack principles (Horn, 1960), and adults do not fare much better (Mazurkiewicz, 1975).

Rule-based instruction. Other theorists who stand in support of the position that English orthography is patterned but incomplete have proposed the teaching of linguistic rules to augment spelling performance. In support of this position Allred (1977) provides the following guidelines: (a) only a few rules, those with few exceptions, should be taught; (b) some rules should be taught, but only one at a time; (c) rules should be taught only when there is a need; and (d) spelling words should be grouped by rule to increase understanding of the rule.

Darch and Simpson (1990) compared two approaches of teaching spelling to twenty-eight upper elementary students with learning disabilities who had been randomly assigned to one of two treatment groups. One group was taught using a visual imagery mnemonic, while the other group was taught using a rule-based spelling system. Three dependent variables included a unit test, posttest, and the *Test of Written Spelling* (Larsen & Hammill, 1986). Those subjects receiving rule-based instruction outperformed the visual imagery group across all three variables. All researchers who suggest the teaching of rules suggest that only a few rules should be taught.

Conclusions

Among the researchers that support the theory that English is regular but incomplete are those who propose teaching spelling through phonetic instruction, and those who propose teaching spelling through rule-based instruction. Both phonic and rule-based instruction have been found to be effective. Problems with phonic instruction include the number of ambiguities in English spelling, such as double consonants, vowel sounds, and words that are not pronounced as they are spelled. Rule-based instruction can be effective if only a few rules are taught, only those rules with few exceptions.

Intervention

Over the vast expanse of spelling research a number of reviews of the literature have been conducted (Fitzsimmons & Loomer, 1979; Graham & Miller, 1979; Peters, 1985). These reviews have successfully delineated the superior intervention techniques from the ineffective. The techniques of reported effectiveness are in the areas of readiness (Allred, 1977; Nicholson & Schacter, 1979; Peters, 1985), word lists (Ayers, 1950; Fitzgerald, 1951; Horn, 1926), test study test (Horn, 1947; Horn, 1976), error analysis (Ganschow, 1984; Nelson, 1980; Silva & Yarborough, 1990), study training (Fernald, 1943; Fitzgerald, 1951; Horn, 1954; Westerman, 1971), and rule-instruction (Horn, 1960; Templeton, 1980). Two studies have been conducted reviewing the literature investigating spelling intervention with students who have learning disabilities (Gordon, Vaughn, & Schumm, 1993; McNaughton, Hughes, & Clark, 1994). For the purposes of this investigation, only those studies employing intervention techniques with leaning disabled subjects will be reviewed.

Studies were obtained that met the following criteria: (a) they were conducted after 1975 due to the passing of P.L. 94-142 resulting in the mandatory provision of services for students with learning disabilities; (b) subjects were identified as having learning disabilities, reading disabilities, or spelling disabilities; (c) the independent variable was an attempt to improve spelling performance; and (d) the experimental design was described. Thirty-six studies were obtained that met the above criteria (see Table 1). These studies are described and compared, examining the following: (a) subject variables, (b) length of intervention, (c) experimental design, (d) independent variables, and (e) dependent measures.

Subject Variables

All subjects were identified as learning disabled, mildly handicapped, reading disabled, or spelling disabled. The total number of subjects in all studies was 1029. The number of subjects per study ranged from one to 215.

Length of Interventions

The length of interventions will be reported as the duration of the study, the time per session, and the number of sessions conducted. The ranges of intervention duration varied; studies were conducted from one day to one school year (180 days). Time in which the interventions were applied ranged from three minutes to forty-five minutes per session. The number of times each intervention was tried ranged from one to 180 times.

Experimental Design

Experimental designs fell into one of two categories, single subject designs or group designs. Eighteen single

Table 1
Spelling Instruction for Subjects With Learning Disabilities

Author(s)	Design	Subjects	Independent Variables	Time	Results
Aleman, McLaughlin, & Bialozor, 1990	alternating treatments	N=7 (9 to 11)	auditory/visual practice; visual/motor practice	20 wks, 100, 10 min sess. superior	auditory/ visual practice
Beck, Matson, & Kazdin, 1983	multiple baseline across word lists	N=2 (11 to 13)	self instruction; no treatment	5-8 days 15, 20 min. sess.	self-instruction superior to no treatment
Bendell, Tollefson & Fine, 1980	mixed with pre/post measures	N=50 (13 to 15)	trace & copy; free study	2 days 2, 15 min.	Ss with internal locus of control better in free study. Ss with external locus of control better with trace and copy
Blau & Loveless, 1982	repeated measures	N=10 (9 to12)	tactile practice left hand tactile practice right hand	1 day 1 sess.	left hand better than right
Bradley, 1981 exp.1	repeated measures	N=10 (x=9-8)	naming a letter while writing;naming letter while assembl. letter tiles; no treatment	4 days, 4 sess. 10 min	naming and writing better than other methods

Table 1 continued

Bradley, 1981 exp. 2	repeated measures	N=9 (x=11)	same as above plus writing word and saying word	4 days 4 sessions	all treatment better than no treatments Naming letters and writing best.
Brown, 1988	mixed with repeated measures	N=14 (x=13)	combination of techniques; traditional instruction.	6 wks, 12 sess. 20-30 m.	combination better for unpredictable words, no difference
Bryant, Drabin, & Gettinger, 1981	pre/post between subjects	N=64 (x=10-2)	3 words per day; 4 words per day; 5 words per day	3 days 3 sess. 30-40m.	3 words better than other two conditions
Dangel, 1989	repeated measures	N=8 (x=11-7)	traditional instruction; sort and study; trace-cover copy-write-sort-study	6 wks. 24 sess.	trace-cover-copy write-sort-study superior to others. All superior to traditional.
Darch & Simpson,1990	repeated measures	N=28 (x=10-6)	rule-based; visual imagery	6 wks. 25 sess. 25-30 m.	rule-based significantly better.
Delquadri, Greenwood, Stretton, & Hall, 1983	reversal with concurrent baselines	N=6 grade 3	peer tutoring; teacher led instruction	27 wks. 135 sess. 15 min.	peer tutoring superior

Table 1 continued

Diaz, McLaughlin, & Williams, 1990	reversal	N=4 (8-13)	add a word spelling program paired with a generalization strategy	15 wks 5 sess/wk.	increased number of target words spelled correctly
Foster & Torgesen, 1983	mixed with repeated measures	N=24 (x=10-2) 16 LD	teacher directed study; free study	1 day 1 sess. 45 min.	significant difference for LD & NLD. Teacher directed better for LD with normal short term mem.
Frank, Wacker, Keith, & Sagan, 1987	multiple probe across subjects	N=4 (8.7 to 10.2)	group instruction; individual instruction; no treatment	2-5 wks. 6-15 sess. 15-30m	both treatments superior to no treatment
Gerber, 1986	multiple baseline across subjects	N=11	imitation modeling to mastery	NR	students gen. first list to subsequent lists with similar ortho-graphic features
Gettinger, Bryant, & Fayne, 1982	pre/post measures between subjects	N=39 (7.2 to 10.7)	combination of practice; conventional instruction	3 wks. 8 sess. 30 min.	combination better than traditional
Graham & Freeman, 1985	mixed with repeated measures	N=40 (x=10-8)	teacher directed study; student controlled study; teacher-monitored study; free study	3 days 2 sess. 30 min.	all conditions superior to free study. No diff. between conditions

Table 1 continued

Harper, Mallette & Moore, 1991	multiple baseline across subjects	N=12	class wide peer tutoring, 5 words each week	14 wks. 15 min	60 % increase in spelling accuracy
Harris, Graham, & Freeman, 1988	mixed with repeated measures	N=40 grade 4	teacher directed; student directed; teacher monitored; free study	3 days 2 sess. 15 min	all directed study out-performed control
Hasselbring, 1984	alternating treatments	N=1 (11)	computer-assisted instruction; teacher directed study.	6 wks. 30 sess.	no difference
Kauffman, Hallahan, Haas, Brame, & Boren, 1978	alternating treatments	N=1 (12)	imitation of errors plus modeling; modeling only	27 days 21 sess. 30 min.	imitation plus modeling superior to modeling only
Kearney & Drabman, 1993	multiple baseline across groups	N=7 (10-3 to 13-5)	pretest, study words missed, say and write.	10 wks. 50 sess. 30 min.	34.9% improve over baseline.
Kohler & Greenwood, 1990	reversal multi-element ABCD	N=7 (7-5 to 8-4)	training in tutoring	3 wks 12 sess. 30 min.	students had higher engage. continued using using beh. 3 weeks after training
McDermott & Watkins, 1983	repeated measures between Ss	N=167 (grades 1-6)	computer assisted instruct. traditional instruction.	1 year	no differnce

Table 1 continued

Mandoli, Mandoli, & McLaughlin, 1982	single subject	N=1 grade 6	peer tutoring	5 weeks 15m/day	increased performance following tutoring
Margalit & Roth, 1989	pre/post	N=36 18 LD 18 MR	strategic procedures emphasizing word structure & spelling with keyboard training.	3 mon. 45 min. per week	significant decrease in spelling errors.
Murphy, Hern, Williams, & McLaughlin, 1990	alternating treatments	N=9 (8-8 to12-3)	copy-cover-compare; traditional instruction	36 weeks 180 sess. 20 min.	copy-cover-compare superior to traditional
Ollendick, Matson, Esveldt-Dawson, Shapiro (1), 1980	alternating treatments	N=2 (8-6 to 10)	positive practice plus positive reinforcement; positive practice; no treatment	4-5 wks. 17-24 10 min.	positive prac. plus positive reinforcement superior to other conditions
Ollendick, Matson, Esveldt-Dawson, & Shapiro (2), 1980	alternating treatments	N=1 (13)	positive practice plus positive reinf.; free study and traditional correction; free study and positive reinforcement.	3 wks 15 sess. 10 min.	positive prac. plus positive reinforcement superior to other conditions
Pratt-Struthers, Struthers, & Williams,1983	multiple baseline across word lists	N=9 (x=11-3)	add a word spelling program; no treatment	50 days 50 sess 3-5 min.	add a word superior to no treatment

Table 1 continued

Stevens & Schuster, 1987	multiple probe word lists	N=1 (11-10)	consistent time delay; unstudied probe vocabulary	2 month 19 sess. 1 hr.	consistent time delay superior
Vaughn, Schumm, & Gordon, 1992	mixed with repeated measures	N=48 grades 2-3 24 LD	copying the word with handwriting; copying with letter tiles; copying on computer	6 sess 30 min	non-LD performed better than LD across all conditions
Vaughn, Schuum, & Gordon, 1993	mixed with repeated measures	N=48 grades 2-3 24 LD	copying words with handwriting; tracing letters to copy words; copying words on computer	11 days 12 sess 20 min.	non-LD perf. sig, better than LD. No difference between cond.
Watkins, 1989	pre/post	N=215	spelling machine program	NR	increased positive attitude
Winterling, 1990	multiple probe across word lists	N=1 (7-7)	copying and constant time delay oral reading practice; no treatment	39 sess. 20-30 min.	no difference
Wong, 1986	pre/post	N=36 grade 6	taught structural word analysis with self-questioning	1 wk.	increased from 27 to 78%.

subject designs were conducted. These studies fell under five design formats. Reversal designs were employed in three of the studies (Delquadri et al., 1983; Diaz et al., 1990; Kohler & Greenwood, 1990). Alternating treatment design was used in four studies (Aleman et al., 1990; Murphy et al, 1990; Ollendick et al, 1980 a; Ollendick et al., 1980 b). Multiple baseline was used in seven studies (Beck et al., 1983; Gerber, 1986; Harper et al., 1991; Hasselbring, 1984; Kauffman et al., 1978; Kearney & Drabman, 1993; Pratt-Struther et al., 1983). Three studies employed a multiple probe design (Frank et al., 1987; Stevens & Schuster, 1987; Winterling, 1989). One design was a simple AB single subject design (Mandoli et al, 1982). Eighteen of the studies can be categorized as group designs. Among the group designs, studies were either repeated measures designs or a pre/post format. The repeated measures format was employed in eleven studies (Blau & Loveless, 1982; Bradley, 1981a; Bradley, 1981b; Brown, 1988; Darch & Simpson, 1990; Foster & Torgesen, 1983; Graham & Freeman, 1985; Harris et al., 1988; McDermott & Watkins, 1983; Vaughn et al., 1992; Vaughn et al., 1993). The remaining seven studies employed a pre/post experimental design (Bendell et al., 1980; Bryant et al., 1981; Dangel, 1989; Gettinger et al., 1982; Margalit & Roth, 1989; Watkins, 1989; Wong, 1989).

Independent Variables

The spelling interventions represented in this research are varied. The independent variables have been divided into the following categories: (a) strategy instruction, (b) modality specific instruction, (c) peer tutoring, (d) computer assisted instruction, (e) error analysis, and (f) combination of procedures. The studies will be discussed according to the independent variable controlled in each.

Strategy instruction.

The theory underlying the training of subjects deficient in spelling achievement in a specific strategy to improve spelling performance is best expressed by Wong (1986). "Effective spelling instruction appears to contain two components: knowledge of phonics and/or the linguistic structure of words and knowledge of spelling strategies" (p. 172). This type of instruction is especially important for use with students with learning disabilities, for these students often perform poorly on memory tasks due to an inability to generate efficient study strategies (Gerber, 1986). Foster and Torgesen (1983) have reported investigations into memory tasks performed by students with learning disabilities as compared with memory tasks completed by students with no learning disabilities. When instructed, students with learning disabilities performed poorly in comparison. Once the students with learning disabilities were given an orienting task, the difference was eliminated between the students with learning disabilities and the normally achieving students. An orienting task is defined as "any task that leads to increased performance" (p. 252).

In their current research, Foster and Torgesen (1983) attempted to evaluate the effects of an orienting task or directed study task on subjects' with learning disabilities spelling performance. Subjects were divided into three groups: LD-S were subjects with short term auditory memory deficits, LD-N were subjects with processing problems, and N were academically average subjects. All three groups were randomly assigned to two study conditions, directed or free study.

Directed study students were given spelling chips to spell words. Each subject was given a stimulus card with four words. Students constructed all of the words with the spelling chips three times. Ten cents was awarded for the first attempt; subsequent attempts were only awarded if the subject constructed the word faster than the previous attempt.

The free study condition students were given one minute to study each word, and they were then quizzed on that word. Subjects were informed that they would receive five cents for each word spelled correctly. Foster and Torgesen (1983) found that some of the subjects with learning disabilities performed similarly to the normal subjects during the directed study condition. The LD-S subjects continued to demonstrate severe spelling problems under both conditions.

Graham and Freeman (1985) compared four instructional conditions. During three of the conditions, students were taught a five step study strategy, in which they were to say and write the word, compare their spelling with the correct model, trace the word, write the word from memory, and say the word. Students were randomly assigned to groups that received varying levels of teacher control; these groups were labled directed study, teacher-monitored, student-controlled, and free-study. During directed study, the instructor provided verbal guidance throughout the strategy. During the teacher-monitored study condition, the instructor provided assistance only upon request. During the student-controlled condition, students were instructed to use the strategy independently without teacher assistance. Finally, during the free-study condition, students were directed to study the words in any way they liked. The subjects in all three experimental groups outperformed the free-study control group. Harris et al. (1988) reported similar findings when employing the same five strategy study steps.

Dangel (1989) compared three interventions similar to those studied by Graham and Freeman (1985) and Harris et al. (1988) in which student-directed study procedures were evaluated against teacher-directed procedures. The interventions compared were teacher-directed traditional instruction involving spelling book activities, sort and study-instruction that involved students planning which words needed more study attention, and sort and study combined with trace, copy, cover, and write. The student-directed procedures were more effective than the teacher-directed procedure. The sort, study, trace, copy, cover, and write condition was the most effective. Problems with Dangel's (1989) study include a possible list and order effect. The same list was used with each condition, and treatments were always introduced in the same order.

Bradley (1981) investigated the effectiveness of a remedial spelling technique for use with children and adults who exhibit severe reading and spelling problems. The steps developed for use in this strategy were as follows: (a) propose a word to learn, (b) correctly write the word or display the word using letter tiles, (c) write the word saying the name of each letter as it is written, and (d) check accuracy and continue until mastery. Results indicate that this strategy was effective at the posttest and at follow-up testing.

Wong (1986) investigated the effectiveness of a seven-step self questioning strategy. The strategy required students to ask themselves the following questions when studying a spelling word: (a) Do I know this word?, (b) How many syllables did I hear in this word (write that number down)?, (c) I'll spell the word; do I have the right number of syllables down?, (d) If yes, is there any part of the word I am not sure of the spelling?, (e) Now, does it look right to me?, and (f) When I'm finished spelling I'll tell myself "I worked hard." Wong (1986) reported that spelling accuracy increased from 27% to 78% in one week.

Beck, Matson, and Kazdin (1983) investigated the effectiveness of a 17 step student-directed spelling program. Students used self-instructional material which had a cartoon figure introducing the spelling steps. All subjects showed improvement over baseline scores after having trained in the steps.

Murphy, Hern, Williams, and McNaughton (1990) compared a student-directed copy-cover-compare strategy of studying words with practicing words in sentences and free study conditions. The copy-cover-compare strategy was superior to the other two study conditions. Pratt-Struthers, Struthers, and Williams (1983) investigated the effectiveness of the copy-cover-compare study strategy with the addition of practice until mastery. Words previously spelled correctly were periodically re-tested, and if missed, became part of the current spelling list. The researchers found that, following the implementation of this technique, a number of list words generalized to writing activities.

Summary of strategic interventions. The training of students in study strategies to improve spelling has been extensively reported in the research literature. This type of instruction is especially relevant for students with learning disabilities who have difficulty spelling. A review of the literature reporting the use of spelling interventions with students who have learning disabilities revealed ten studies. Each of these studies demonstrated that a study strategy can improve the spelling performance of students with learning disabilities.

Modality specific instruction. Spelling research carried out with mildly handicapped students has led to a variety of investigations involving modality combinations other than the visual input with written output traditionally used in spelling instruction. Blau and Loveless (1982) blindfolded students and asked them to say the names of the letters as they were assembling words using plastic tiles. The variable controlled in this study was the hand (right or left) that was used to assemble the letter tiles. These reseachers found the left hand condition to be superior to the right hand condition. The percentage of words spelled correctly was 61% and 46% respectively.

Aleman, McLaughlin, and Bialozor (1990) compared an auditory-visual condition with visual motor spelling practice. The auditory-visual practice condition was superior to the visual-motor condition. These findings may be confounded by the increased number of opportunities to practice each word that was allowed during the auditory-visual practice condition.

Teaching students the rules for spelling has generated a lot of arguments (Fitzsimmons & Loomer, 1979) because of the inconsistent nature of the English language. Those who advocate rule instruction (Allred, 1977) advocate teaching only a few rules with least number of exceptions (Horn, 1960), and those rules taught should be taught with an opportunity to practice.

Darch and Simpson (1990) compared instruction in visual imagery techniques with instruction in rule-based strategies. The visual imagery groups were presented with fifteen words per lesson on an overhead projector. When a word was presented, students were to look at the word and apply a four-step strategy that included (a) covering the word and making an image in the mind, (b) imagining the word on a large outdoor screen, (c) imagining each letter of the word pasted on the screen, and (d) imagining themselves nailing each letter of the word onto the screen. The rule-based group was instructed in the *Spelling Mastery Program* (Dixon & Engelmann, 1979). This program contains 137 curriculum-based spelling strategies that teach spelling through instruction in morphographs and phonic rules.

Three dependent measures were employed: unit tests, a posttest on all of the words, and the *Test of Written Spelling* (Larsen & Hammill, 1986). Students in the Spelling Mastery group outperformed the visual imagery group across all measures. A multiple analysis of variance (MANOVA) was conducted between both groups (2,24) = 9.87, *p* <. 01.

Several studies investigated the use of handwriting of words on acquisition of those words (Bradley, 1981 exp. 1; Bradley, 1981 exp. 2; Vaughn et al., 1992; Vaughn et al., 1993). Bradley (1981 exp. 1) compared three conditions: (a) having students say each letter while writing the word, (b) having students say each letter while selecting plastic letter tiles and placing them in the correct order to spell the word, and (c) having students test without studying. The handwriting condition was significantly better than the plastic tile condition. Both experimental conditions were better than the no study condition.

In the second experiment, Bradley (1981) attempted to isolate the effect of saying the letters aloud while studying. In addition to the three conditions conducted in experiment one, a fourth condition was added in which students did not pronounce each letter but said the whole word when they finished writing. All experimental subjects outperformed the control subjects during the acquisition phase. During the maintenance phase, the saying of each letter name as it was written was superior to the other two experimental conditions. Kearney and Drabman (1993) used a pretest to determine which words students needed to study. The test-study-test procedure is a practice supported by research (Fitzsimmons & Loomer, 1978). Students were then instructed to say and write the target words until mastery was achieved. Subjects demonstrated a 34.9% improvement over baseline scores.

Summary of modality specific instruction. The use of alternate modalities has been a recommended technique for students with learning disabilities (Fernald, 1943; Gillingham & Stillman, 1936). Many of these studies suffer from threats to internal validity. Either there exists failure to include a comparison with traditional instruction (Blau & Loveless, 1982), or the practice opportunities are not divided equally among experimental conditions (Aleman et al., 1990); and finally, a number of comparison studies demonstrate more favorable results for the traditional method. For example, rule-based instruction was more favorable than the visual imagery condition (Darch & Simpson, 1990), and handwriting of words proved to be superior to assembling of letter tiles (Bradley, 1981; Vaughn et al., 1992; Vaughn et al., 1993).

Computer assisted instruction (CAI). With the availability and increasing "user friendliness" of computers, a number of studies have been conducted investigating the effectiveness of computers integrated into the spelling program (Hasselbring, 1984; Kinney et al., 1988; Margalit & Roth, 1989; McDermott & Watkins, 1983; Stevens & Schuster, 1987; Watkins, 1989).

Watkins (1989) conducted a study that was qualitative in nature. He found that students receiving drill and practice activities on the computer for the duration of one school year expressed a significantly more positive attitude toward their spelling work.

Margalit and Roth (1989) used CAI with 36 middle and high school students with mild disabilities. The instruction emphasized awareness of word structure, spelling strategies, and keyboard training. The researchers reported a significant decrease in spelling errors.

Time delay procedures have been investigated using CAI Kinney et al., 1988; Stevens & Schuster, 1987). Time delay is an instructional method that transfers stimulus control (a prompt that signals the correct response) to a new stimulus (a target response); this is accomplished by pairing the controlling stimulus with the new stimulus. Time before the presentation of the controlling stimulus is systematically increased before the student provides the correct response. Stevens and Schuster (1987) found a five second time delay improved the spelling performance of a student on 15 target words. The student maintained the correct spelling of these words over a two month period.

In a similar study, Kinney et al. (1988) investigated time delay procedures using CAI. The researchers found CAI to be an effective means to teach spelling because it allows for immediate feedback, controls the instructional pace, and is reinforcing to students.

McDermott and Watkins (1983) compared traditional classroom instruction in spelling with a computer assisted cover-copy-compare procedure. Following one year of instruction, the two groups were tested using the *Wide Range Achievment Test* (Jastak & Jastak, 1965), and both groups made equivalent gains. These results may be due to the insensitivity of the dependent measure.

Hasselbring (1984) compared teacher provision of imitation plus modeling feedback with provision of imitation plus modeling feedback by a computer. Similar results were obtained at posttest for both conditions.

Summary of c.a.i. The use of computers in the teaching and practicing of spelling words, although relatively recent, is increasing in popularity. Students claim to enjoy practicing their spelling on the computer (Watkins, 1989). Spelling errors have been decreased through computer usage as well as individualization of spelling instruction (Margalit & Roth, 1989). CAI may be used as an additional means to improve spelling performance.

Peer Tutoring. With the current trend to include many students with mild disabilities in mainstream educational programs, the need for peer tutoring has been extensively investigated. Four studies were conducted that investigated the effectiveness of peer tutoring in spelling research involving subjects with learning disabilities (Delquadri et al., 1983; Harper et al., 1991; Kohler & Greenwood, 1990;

Mandoli et al., 1982).

Mandoli et al. (1982) reported that mainstreamed mildly handicapped students obtained higher scores on spelling tests during a peer tutoring condition than during baseline in which no peer tutoring occurred. Harper et al. (1991) found classwide peer tutoring to result in 100% mastery of weekly spelling words.

Delquadri, Greenwood, Stretton, and Hall (1983) paired students with learning disabilities with students who were achieving normally. The students took turns as instructors (dictating words and making corrections) or students (providing responses). The peer tutoring condition produced higher achievement than the teacher centered instructional model.

Kohler and Greenwood (1990) trained three peer tutors to work with four poor spellers. The authors reported a higher rate of engagement when peers were involved. The benefits were two-fold; poor spellers increased their scores on weekly tests, while tutors maintained their collateral tutor behavior three weeks after initial training.

Summary of peer tutoring. Peer tutoring creates a situation in which one on one instruction can occur in a regular classroom. With the increased number of mildly handicapped students in the mainstream, the need for intensive practice and feedback for these students increases. Peer tutoring is an inexpensive alternative that has been demonstrated to be effective.

Error imitation. The use of error imitation has been investigated in the spelling research literature (Gerber, 1986; Kauffman, Hallahan, Brame, & Boren, 1978; Nulman & Gerber, 1984). In error imitation the teacher reproduces the child's error and then models the correct response. Kauffman et al. (1978) was the first to investigate these techniques with learning disabled subjects in spelling. These researchers compared error imitation with error imitation plus modeling. The error imitation plus modeling condition was superior to error imitation alone, while both conditions were superior to the control. The results were better for nonphonetic spellings than for phonetic spellings.

Nulman and Gerber (1984) replicated the Kauffman et al (1978) study with a single subject. They found that the error imitation plus modeling condition with a sufficient number of trials improved the spelling performance of an eight year old boy with learning disabilities.

Gerber (1986) taught students a list of target words, and then tested the students and gave feedback on those words missed using error imitation plus modeling. Students with learning disabilities were able to generalize spelling knowledge to lists which had untrained words that contained similar orthographic features.

Summary of error imitation. Although studies that have investigated the use of error imitation and modeling are few with a small number of students participating in each study, the effects demonstrated are positive. More research needs to be conducted in this area.

Combinations of procedures. Two studies were identified which can be characterized as combination approaches. A combination approach is one that employs a package of intervention techniques. Gettinger, Bryant, and Fayne (1982) used reduced unit size, practice and review with feedback, and training for transfer. These techniques were compared with traditional instruction which was characterized by the introduction of a large number of words at one time, the absence of feedback, and the use of games and repetitive writing activities. The experimental group outperformed the group receiving traditional instruction. The experimental group also outscored the control group on the transfer of newly acquired spelling knowledge to words that were not used in training.

Brown (1988) compared several research supported techniques with traditional techniques. Traditional techniques included (a) multi-sensory learning activities, (b) practice using worksheets and games, and (c) structural and phonic analysis of words. The experimental group received instruction consisting of immediate error imitation and practice, computer practice, and, reduced unit size. No significant differences were obtained pre/post for the experimental group using the *Test of Written Spelling* (Larsen

& Hammill, 1986) on words with predictable spellings. Statistical comparison revealed a slight advantage for the experimental subjects on words with unpredictable spellings.

Dependent Measures

In the studies reviewed, the vast majority conducted dictation tests or review of students' writings to ascertain the effectiveness of intervention techniques. Dictation tests consist of a teacher orally presenting words for the students to spell on a blank piece of paper. Advantages of this type of assessment include (a) the small amount of preparation necessary to prepare such tests, (b) the possibility of assessing a large group of students concurrently, and (c) the fact that high correlations exist between such tests and written products (Tindall & Marston, 1990). Disadvantages to the use of dictation tests include the following: (a) scoring difficulties due to handwriting illegibility, (b) writing skill is a prerequisite to determine spelling skill, and (c) correct spelling may be influenced by the examiner's pronunciation of the word (Tindall & Marston,1990).

Three standardized measures were used in the studies reviewed: *The Wide Range Achievement Test* (Jastak & Jastak, 1965), *The Test of Written Spelling* (Larsen & Hammill, 1986), and *The Test of Written Language* (Hammill & Larsen, 1978). McNaughton, Hughes, and Clark (1994) describe the use of standardized achievement tests in spelling research as problematical. "The item pool may be too small and difference in item difficulty may be too great to detect incremental changes with LD" (p. 180) Another problem may exist when the vocabulary used for instruction differs significantly from the tested vocabulary.

Conclusions

The major problem with spelling research exists not in the research that has been done but in the dissemination of this literature. Fitzgerald (1951) accurately describes our current dilemma forty years prior:

> Although many spelling investigations have been carried out during the past half century, improvement in the working of spelling has been slow. One of the chief difficulties seems to have been that the results of research and experimentation were not readily available to the teacher. Although additional investigations are necessary to solve some of the more complex problems of spelling, many of the immediate spelling problems can be solved by the use of available research findings. (pp. 2 3)

Or as more recently stated by Fitzsimmons and Loomer (1979): "Historically spelling has been one of the most frequently investigated areas of the curriculum. However, improvement in spelling programs does not seem commensurate with research efforts." (p. 61)

At the secondary level, little attention, if any, is given to spelling instruction, although spelling remains a deterrent to effective writing for 1 in 10 secondary students (Silva & Yarborough, 1990). If a program were implemented at the secondary level which included (a) teaching students specific strategies for studying, (b) classifying student errors and providing feedback, (c) using computers to enhance student interest, and (d) including peer tutoring to increase engagement and the occurrence of one-on-one instruction, improvement might occur in the spelling of this population.

Effective Teaching Literature

A number of processes have been identified as an effective means to increase students' academic achievement (Bickle & Bickle, 1986; Brophy & Good, 1986; Englert, Tarrant, & Marriage, 1992; Rosenshine & Stevens, 1986). Emerging from this literature are a group of teaching techniques that are necessary components for any effective instructional unit. For the purposes of this research, these processes will be categorized as pre-instructional, instructional, and post-instructional. Each of these will be discussed below with the role it plays in spelling research presented.

Pre-instructional Techniques

Pre-instructional techniques include those activities that the student must engage in before instruction takes place. In spelling research, pre-instructional activities include determining readiness, goal-setting, and pre-testing.

A number of researchers in the area of spelling have identified factors that indicate readiness to learn to spell (Allred, 1977; Peters, 1985). Allred (1977) outlined the following elements required in a subject before spelling instruction should begin; a student must (a) be able to name and write or represent all of the letters of the alphabet, (b) be able to copy words correctly, (c) be able to write his name without copying, (d) be able to read at a second grade level, (e) be able to enunciate words clearly, (f) understand that words are composed of different letters, (g) have a beginning phonetic sense, (h) be able to write a few words from memory, (i) be able to ask for words when in doubt, and (j) demonstrate an interest in learning to spell. Peters (1985) identified four readiness elements for the beginning speller; he (a) must be able to read, (b) must be able to recall the word, (c) must be able to reconstruct a word letter by letter, and (d) must be able to encode graphemically.

Goal setting results from the matching of instruction to student needs and task characteristics. Goals are the foundation upon which further instruction is planned. The presentation of clear goals and precise directions has been found to improve student attention and achievement (Berliner, 1982). Effective goal presentation includes stating what the student will learn and what the student needs to do (Christensen, Ysseldyke, & Thurlow, 1989). Students need challenges: this is supported by research that documents difficult but attainable goals lead to higher achievement than do easier goals (Locke & Latham, 1990). Prior to spelling instruction, a student can establish a goal for the number of words attempted. The recommended number of words is five to ten per week (Bryant, Drabin, & Gettinger, 1983; Burn & Browman, 1983).

One relatively simple procedure that has been widely researched is the test study test procedure (Horn, 1947). Students take a test over words having had no previous exposure to the word list. They then correct their own tests as the teacher or another pupil spells each word orally. Students are only responsible for studying the words missed on the pre-test. The first published investigation of the corrected test occurred in 1947 (Horn, 1947). Two hundred and sixty-eight sixth grade students in three school systems were involved. The spelling books regularly employed within the school system were used. Each test consisted of 25 words, five of which were review words from the previous four weeks. Horn (1947) found the corrected test contributed from 90% to 95% of achievement. The corrected test alone, in some cases, was sufficient spelling instruction. Horn (1947) maintains that the corrected test was "the most important single factor to spelling achievement." (p. 285)

Instructional Techniques

Systematic and explicit instruction describes the stages of the instructional process. These stages involve demonstration, prompt, and practice (Rosenshine & Stevens, 1986). Effective instruction demands active involvement of the teacher and students. This instruction is characterized by a high level of organization. In a step by step fashion, skills are identified, the importance of learning the skill is discussed, and students are then taught how to use and apply the skills (Rosenshine & Stevens, 1986).

Periodic checks must be conducted by the teacher to ensure student understanding (Good, 1983). Researchers at the University of Kansas Center for Research in Learning have investigated the teaching process and have identified three steps as characterizing effective teaching. The steps include demonstration, guided practice with feedback, and independent practice with feedback (Deshler, Schumaker, & Lenz, 1984).

Systematic and explicit instructional techniques were employed in the training of the spelling study strategies in nine of the studies reported previously (Beck et al., 1983; Bradley, 1981 exp. 1 & 2; Dangel, 1989; Foster & Torgensen, 1983; Graham & Freeman, 1985; Harris et al., 1988; Murphy et al., 1990; Pratt-Struthers, 1983; Wong, 1986). Although the specific steps varied in each study, procedures for instructing the steps were similar.

Post-Instructional Techniques

A number of techniques are reported in the effective teaching literature to be used following instruction. Among these techniques are monitoring progress, providing feedback, and programming for generalization. Each of these activities will be discussed below, and the research conducted in spelling that include these procedures will be presented.

Monitoring Progress. Monitoring student progress involves a teacher checking on the behavior and academic work of a student. This is done frequently to ensure that an appropriate match exists between the learner and the task. Adaptations are made if a match between learner and task does not exist. Good and Brophy (1986) identify active and frequent monitoring as the key to student learning. Active monitoring includes checking student understanding of the task requirements and verifying student understanding of the procedures necessary to complete the task. Rieth and Everston (1988) report that a teacher moving about the classroom checking student work and engaging in substantive interactions with students increases on task academic responding of students with learning problems.

Monitoring student progress is achieved in recent spelling research by teacher observation, computer assisted instruction, and peer tutoring. CAI can provide students with immediate and continuous knowledge of their progress, and it has increased the effectiveness of teacher monitoring in spelling instruction (Kinney et al., 1988; Margalit & Roth, 1989; Stevens & Schuster, 1987; Watkins, 1989). Peer tutoring is another technique which improves the monitoring of spelling achievement. Through one-on-one interaction, students can receive rapid feedback (Delquadri et al., 1983; Harper et al., 1991; Kohler & Greenwood, 1990; Mandoli et al., 1982).

Provision of feedback. Academic feedback is positively associated with student learning. Rieth and Everston (1988) rate feedback among the most essential of teacher behaviors for promoting positive learning outcomes. Wang (1987) found feedback to be important in promoting the following student outcomes: (a) mastery of content and skills for future learning, (b) ability of a student to learn independently, (c) ability to plan and monitor learning activities, (d) motivation for continued learning, and (e) confidence in one's ability as a learner. Teachers who provide immediate corrective feedback on errors produce higher student achievement (Gersten, Carnine, & Woodward, 1987).

In recent spelling research, the provision of feedback has been accompanied with error imitation and modeling of the correct response. Several studies have reported on this technique; all have demonstrated effective results (Gerber, 1986; Kauffman et al., 1978; Nulman & Gerber, 1984).

Generalization. Generalization is the performance of targeted behavior in other nontraining conditions (across settings, subjects, people, or time) (Stokes & Baer, 1977). Students with mild disabilities must be taught to generalize (Ellis, Lenz, & Sabornie, 1987).

In spelling research, an effective spelling strategy alone does not guarantee that the words taught will be used in the written work. Diaz, McLaughlin, and Williams (1990) advocate having students keep an index file of spelling words with each card representing a different word, and the word used correctly in a sentence on the card. Graham (1983) supports the need to ensure generalization, claiming that for this to occur, spelling must be integrated within the writing process.

Generalization of new spelling knowledge was reported in four of the studies reviewed. In two studies, generalization was measured as the transfer of skills to untrained vocabulary (Gerber, 1986; Nulman & Gerber, 1984). Two investigations were undertaken to measure the generalization of target words to written work (Diaz et al., 1990; Pratt-Struthers et al., 1983).

Conclusions

Effective instruction has been researched extensively over that last decade. A number of components have been identified that bolster academic achievement. Among the processes necessary for effective spelling instruction are: determining readiness, goal setting, pre-testing, systematic and explicit instruction, monitoring progress, provision of feedback, and programming for generalization. Each of these components needs to be an integral part of any instructional unit.

Summary

Spelling research has been conducted since the 1920's. Spelling has been one of the most widely researched instructional areas. Out of this research have emerged two theoretical positions. One position states that English is irregular. Existing within this theoretical framework are researchers who support a synthetic alphabet and those who advocate teaching spelling through a whole word approach. Opposing theorists view English orthography as patterned but incomplete. Researchers in support of this position advocate teaching phonics to improve spelling, or the teaching of rules. Due to the complexities inherent in the skill of spelling, theorists have become divided in their efforts to improve spelling ability. This theoretical partitioning has blinded one group of researchers to the other's accomplishments. A model for spelling research needs to include aspects of both theoretical schools of thought.

A multitude of effective spelling interventions have been identified over the past seventy years, but a problem still exists with the use of the effective interventions. Many commercial spelling programs do not take into consideration the research. Few secondary programs work on teaching spelling at all. There appears to be a need for a program designed to improve spelling of the secondary student. For those students with learning disabilities who exhibit severe problems with spelling into adulthood, this need cannot be overlooked. This program would need to encompass the effective techniques identified in the spelling intervention literature, such as error imitation and modeling, study strategies, computer assisted instruction, and peer tutoring procedures. These techniques would be taught using the identified effective teaching techniques: establishing readiness, goal setting, pretesting, systematic instruction, monitoring progress, providing feedback, and programming for generalization.

CHAPTER III
METHODS AND PROCEDURES

Introduction

The research method outlined in this chapter consists of applied behavior analysis procedures used to investigate the effectiveness of a strategic intervention for teaching students with learning disabilities to improve spelling. The questions investigated were as follows:

1. Will training in the spelling strategy increase the percentage of words spelled correctly on the weekly spelling test?

2. Will training in the spelling strategy increase the number of words written during seven minutes of free writing?

3. Will training in the spelling strategy increase the number of target words, words subjects have spelled correctly on the weekly tests, spelled correctly in the daily writing samples?

The methodology of this investigation is discussed and includes: setting, subject description and selection, description of the treatment procedures, description of instructional procedures, reliability and validity procedures, experimental design, and analysis of the data.

Setting

The research was conducted at Camden County High School in Kingsland, Georgia. Classrooms were selected for inclusion in this study because the teachers expressed a willingness to participate in this study. Teachers selected were an English teacher working in regular classrooms and participating in a collaboration project, and a special education teacher working in a resource classroom. The collaboration project involves an agreement for a special educator to team teach with the regular education teacher. Both teachers have received a minimum of 12 hours of in-service training in collaboration before they begin working together. Following teacher training, 4 to 8 students with learning disabilities and or behavior disorders are then mainstreamed in the collaborative classroom.

The resource classroom is an English class with ten ninth-grade students who have been identified as having learning disablities, behavioral disorders, or mild intellectual disabilities. The students are considered to have academic deficits too severe for inclusion in the mainstream setting.

Subject Description and Selection

Subjects were ninth grade students with learning disabilities identified via the eligibility guidelines outlined in the state of Georgia and including criteria outlined by the Council for Exceptional Children, Division of Learning Disabilities (Council For Learning Disabilities, 1992). These students were receiving English instruction in the regular classroom or in a resource room. Subjects ($\underline{N}$=10) were selected to participate who had misspelled greater than ten percent of the words during a ten minute free writing assignment (Silva & Yarborough, 1990) and/or who had obtained standard scores two or more standard deviations below the mean on the *Test of Written Spelling* (Hammill & Larsen, 1986). This test was used because of the high test-retest reliability and internal consistency, reported at .86 to .99 and .86 to .98 respectively (Tindall & Marston, 1990)

Parental consent was obtained for those students participating in this study (see Appendix C). Information regarding students' IQ and achievement levels was obtained from each individual's school folder.

Demographic information on subjects was collected including: special education category, placement, age, grade level, IQ, sex, ethnicity, socio-economic status, and standardized test scores of achievement (Council for Learning Disabilities, 1992) (see Table 2). Approval for the subjects to be tested, trained, and observed was granted from the University of Florida Institutional Review Board (see Appendix A), the Camden County Board of Education (see Appendix B), and the subjects' parents (see Appendix C). Student willingness to participate in this study was also obtained.

Subject 1 (S1) is an African American male who at the time of this study was 15 years and 3 months old. He

Table 2 Subject Demographic Information

Subject	Age	Gender	SES	Ethnicity	ESE/Class.	IQ/Test	Reading Comp./Test	Written Express.	Spelling TWS-II
1	15-3	M	X	A	SLD	105/WISCIII	DAB/90	DAB/85	P-79 U-73
2	15-3	M		E	SLD	92/WISCIII	WJAT/85	WJAT/70	P-91 U-73
3	14-5	M		E	SLD	107/WISCIII	DAB/105	NA	P-72
4	15-11	M	X	A	SLD	86/KBIT	DAB/85	DAB/75	P-71 U-68
5	15-10	M		A	SLD	92/WISCIII	DAB/80	DAB/70	P-84 U-71
6	16-3	M		E	SLD	101/WISCIII	WJ-R/53	WJ-R/90	P-75 U-69
7	15-7	M		E	SLD	94/WISCIII	DAB/85	DAB/60	P-75 U-77
8	15-9	M		E	SLD	102/WISCIII	WIAT/72	WIAT/64	P-76 U-73
9	15-5	F		E	SLD	92/WISCIII	DAB/90	DAB/85	P-84 U-83
10	16-0	M	X	A	SLD	95/WISCIII	WIAT/81	WIAT/59	P-76 U-79

SES X=PARTICIPATION IN THE FREE AND REDUCED LUNCH PROGRAM

Ethnicity A=African American
E=European American

receives free or reduced lunch. A psychological battery was conducted in 1993 for re-evaluation to determine the appropriateness of special education placement. At this time a full scale IQ of 105 was obtained on the *Weschler Intelligence Test for Children Revised* (WISC-III) with a verbal IQ score of 101 and a performance IQ score of 108. The *Diagnostic Achievement Battery* (DAB) was also administered resulting in a reading comprehension standard score (SS) of 90 and a written composition standard score (SS) of 85. Prior to involvement in this study the *Test of Written Spelling III* (TWS-III) was administered. A standard score of 79 was obtained for predictable words and 73 for unpredictable words. S1 was being served for a learning disability in a collaborative English classroom.

Subject 2 (S2) is a European American male who at the time of this investigation was 15 years and 3 months old. A psychological battery was conducted in 1992 for re-evaluation to determine the appropriateness of special education placement. At this time a full scale IQ score of 92 was obtained on the WISC-III with a verbal IQ score of 90 and a performance IQ of 96. The *Woodcock Johnson Achievement Test* (WJAT) was also administered resulting in a reading comprehension SS of 85 and a written language SS of 70. Prior to involvement in this study the TWS-III was administered. A SS of 91 was obtained for predictable words and SS of 73 for unpredictable words. S2 was being served for a learning disability in a collaborative English classroom.

Subject 3 (S3) is a European American male who at the time of this investigation was 14 years 5 months old. A psychological battery was last administered in 1992 for the purpose of re-evaluation to determine the appropriateness of special education placement. At this time a full scale IQ of 107 was obtained on the WISC-III with a verbal IQ of 106 and a performance IQ of 108. The DAB was also administered resulting in a reading comprehension SS of 105. Prior to involvement in this study the TWS-III was administered. A SS of 72 was obtained for predictable words. S3 was being served for a learning disability in a collaborative English class.

Subject 4 (S4) is an African American male who at the time of this study was 15 years and 11 months old. He received free or reduced lunch. A psychological battery was last conducted in 1993. At this time a full scale IQ of 86 was obtained on the *Kaufman Brief Intelligence Test* (KBIT) with composite scores of 96 and 78 respectively. The DAB was also administered resulting in a reading comprehension SS of 85 and a written composition SS of 75. Prior to inclusion in this study the TWS-III was administered. A SS of 71 was obtained for predictable words and a SS 68 was obtained for unpredictable words. S4 was being served for a learning disability in a resource English classroom.

Subject 5 (S5) is an African-American male who at the time of this study was 15 years 10 months old. A psychological battery was conducted most recently in 1993. At this time a full scale IQ score of 97 was obtained on the WISC-III with a verbal IQ score of 90 and a performance IQ of 106. The DAB was also administered resulting in a reading comprehension SS of 80 and a written comprehension SS of 70. Prior to involvement in this study the TWS-III was administered. A SS of 84 was obtained for predictable words and a SS of 71 was obtained for unpredictable words. S5 was being served for a learning disability in a resource English classroom.

Subject 6 (S6) is a European American male who at the time of this investigation was 16 years and 3 months old. The most recent psychological battery was conducted in 1994 resulting in a full scale IQ score of 101 on the WISC-III with a verbal IQ score of 108 and a performance IQ score of 93. The WJAT was also administered resulting in a reading comprehension SS of 53 and a written composition SS of 90. Prior to involvement in this investigation the TWS-III was administered. A SS of 75 was obtained for predictable words and a SS of 69 was obtained for unpredictable words. S6 was being served for a learning disability in a resource English classroom.

Subject 7 (S7) is a European American male who at the time of this study was 15 years 7 months old. A psychological battery was conducted most recently in 1993 for the purpose of re-evaluation to determine the appropriateness of special education placement. At this time a full scale IQ score of 94 was obtained on the WISC-III with a verbal IQ score of 94 and a performance IQ score of 98. During this evaluation the DAB was also administered resulting in a reading comprehension SS of 85 and a written composition SS of 60. Prior to involvement in the study the TWS-III was administered. A SS of 75 was obtained for predictable words and a SS of 79 for unpredictable words. S7 was being served for a learning disability in a collaborative English classroom.

Subject 8 (S8) is a European American male who suffers from spastic theresis of the lower extremities with two degrees CPE. At the time of this study he was 15 years 9 months old. The most recent psychological evaluation was conducted in 1992 for the purpose of re-evaluation to determine the appropriateness of special education placement. At this time a full scale IQ score of 102 was obtained on the WISC-III with a verbal IQ score of 102 and a performance IQ score of 102. The *Weschler Individual Achievement Test* (WIAT) was also administered resulting in a reading comprehension SS of 72 and a written expression SS of 64. Prior to involvement in this investigation the TWS-III was administered. A SS of 76 was obtained for predictable words and a SS of 73 was obtained for unpredictable words. S8 was being served for a learning disability in a collaborative English classroom.

Subject 9 (S9) is a European American female who at the time of this study was 15 years and 5 months old. The most recent psychological evaluation was conducted in 1992 for re-evaluation purposes to determine the appropriateness of special education placement. At this time a full scale IQ of 92 was obtained on the WISC-III with a verbal IQ score of 91 and a performance IQ score of 94. During this evaluation the DAB was also administered resulting in a reading comprehension SS of 90 and a written composition SS of 85. Prior to involvement in this investigation the TWS-III was administered. A SS of 84 was obtained for predictable words and a SS of 83 for unpredictable words. S9 was being served for a learning disability in a collaborative English classroom.

Subject 10 (S10) is an African American male who at the time of this study was sixteen years old. He received free or reduced lunch. The most recent psychological evaluation was conducted in 1992 for the purpose of determining the appropriateness of special education placement. At this time a full scale IQ of 95 was obtained on the WISC-III with a verbal IQ score of 95 and a performance IQ score of 95. The WIAT was also administered resulting in a reading comprehension SS of 81 and a written composition SS of 59. Prior to involvement in this study the TWS-III was administered. A SS of 76 was obtained for predictable words and a SS of 79 was obtained for unpredictable words. S10 was being served for a learning disability in a resource English classroom.

Description of Spelling Strategy

The independent variable, developed by the researcher, employed in this study was a spelling strategy, SPELL. The SPELL strategy was based on principles found to be effective in learning to spell. The mnemonic SPELL was created to assist learners in remembering the study steps needed when studying a spelling word.

The following description outlines each stage of the strategy and the purpose underlying each stage. Included are the teacher and student behaviors that need to be exhibited.

Instructional Procedures

The spelling study strategy, SPELL, was designed to include instructional procedures to promote skill acquisition and generalization in adolescents with learning disabilities. The following describes the instructional procedures employed in this study (see Appendix D for a more detailed description).

Stage 1: Pretest and Obtain Commitment

Purpose: To establish a need for subject's instruction in the strategy and to ensure that subjects are committed to learning the strategy.

Stage 2: Describe the Strategy

Purpose: To describe the steps of the SPELL strategy and to provide subjects with a rationale for strategy use.

Stage 3: Model the Strategy

Purpose: To provide subjects with an understanding of strategy steps and the underlying thinking processes that accompany each step.

Stage 4: Verbal Rehearsal

Purpose: To ensure that subjects can state each of the steps of the SPELL strategy automatically.

Stage 5: Guided Practice and Feedback

Purpose: To provide students practice in the use of the SPELL strategy with instructional guidance. Elaborative feedback following error analysis is provided to each subject, following examination of the incorrect and the correct response (Kauffman et al., 1978; Kline, 1990; Silva & Yarborough, 1990).

Stage 6: Advanced Practice and Feedback

Purpose: To provide students practice in the use of the SPELL strategy with misspelled words while providing minimal guidance in strategy use.

Stage 7: Posttest and Maintenance

Purpose: To ensure correct use of strategy steps after training in the strategy and to monitor continued use of the strategy.

Stage 8: Assessment of and Promotion of Generalization

Purpose: To promote generalization of the SPELL strategy to independent writing assignments.

Instruments

Instruments employed in this study included screening instruments, weekly spelling probes, and assessment of strategy acquisition. Each of these will be described below.

Screening Assessment

Two methods were used to ascertain subjects' need for strategy instruction: a standardized measure of spelling achievement, the *Test of Written Spelling* (Hammill & Larsen, 1986), and the percentage of words spelled incorrectly during a ten minute writing sample. *The Test of Written Spelling* was chosen because of the reported reliability and validity data. The test-retest reliability is .86 to .99, and the internal consistency is .86 to .98 (Tindall & Marston, 1990). In the review of 36 studies involving training subjects with learning disabilities using spelling interventions (see Chapter 2), the *Test of Written Spelling* was one of three standardized measures that was used. The free writing sample, although an easy and practical means for determining problems with spelling, may not be sufficient due to the fact that students may only chose words they are able to spell (Tindal & Marston, 1990). Students, identified as learning disabled, were considered for participation in this study if either 10% of the words were misspelled during the free writing trial, or if they had standard scores that were one or more standard deviations below the mean on the standardized spelling measure.

Assessment of Strategy Acquisition

One experimenter designed instrument was used to assess strategy acquisition and maintenance (see Appendix E). In addition, direct observation was used to determine if students were using the strategy steps correctly, and if they continued to use the steps after instruction in the steps was terminated.

A weekly dictation test was used to determine effectiveness of strategy instruction. Advantages to use of dictation tests include (a) the small amount of advance preparation needed to prepare the test, (b) the possibility of testing many students concurrently, and (c) the fact that high correlations exist between dictation tests and written work (Tindal & Marston, 1990), and (d) the ability to easily incorporate peers in the testing of fellow students (Gordon, Vaughn, & Schuum, 1993). Several studies (see Chapter 2) have successfully used peer tutors to dictate individual word lists. Several disadvantages to the use of a dictation test include legibility of the writing and motor ability (Tindal & Marston, 1990). Both of these can be controlled by computer availability for testing, writing, and word study (Gordon et al., 1993).

Reliability of Procedures

Several procedures were used before and during the study to establish reliability of measurement and instructional procedures. Interscorer agreement was calculated on the percent correct obtained on the dictation tests and in the analysis of errors. Interrater agreement was calculated for trained observers rating of instructional sessions.

Interscorer Agreement

During the experiment two colleagues of the experimenter were given copies of the spelling probes to analyze errors. Each of the scorers was given a training session, prior to implementation of the study, in using the error analysis check list (see Appendix F & J). Following training the error analysis checklist was piloted and several error categories were added to facilitate its use. Even with these changes the error analysis checklist was problematic. Interscorer agreement percentages were obtained by dividing the possible agreements for the analysis by the actual number of agreements recorded plus the number of non-agreements and multiplying the dividend by 100.

INTERSCORER AGREEMENT=

$$\frac{\text{TOTAL AGREEMENTS}}{\text{TOTAL AGREEMENTS + NON-AGREEMENTS}} \quad \text{X} \quad 100$$

The interscorer agreement for scoring of the dictation tests was 100.0%. The interscorer agreement on the error analysis checklist was variable. The scores ranged from 25.0% agreement to 79.2% agreement with a mean agreement score of 47.7%. Scorer 1 (SC1), an English teacher with a background in literature instruction, scored many errors as nondecodable. The range of words scored as nondecodable was 88.0% to 71.4% with a mean of 80.9%. Scorer 2 (SC2), and English teacher with a background in reading instruction, scored fewer words as nondecodable. The range of words scored as nondecodable for SC2 was 22.7% to 80.8% with a mean of 41.7%. The failure to establish precision in the analysis of errors in no way effected the integrity of this study. The questions posed can be answered without high interscorer agreement on the error analysis checklist. The error analysis was a component that the researcher wanted to include to investigate the necessity of its inclusion in the spelling program. More research needs to be conducted before the error analysis component can be recommended.

Procedural Reliability

Procedural reliability was ensured by the use of two independent observers. These observers randomly observed two 30 minute instructional sessions to determine if instructional procedures were consistent between the two teachers participating in the study. The observers recorded teacher behaviors to ensure that (a) the instructional sequence and script were followed, (b) the pacing was fluent, and (c) the materials were used appropriately (see Appendix K). This represented 30 opportunities to record the presence or absence of the occurrence of the above named behaviors. No disagreements were observed. An interrater agreement score of 100.0% was calculated.

Training of Personnel

Prior to beginning the study, personnel were trained in implementing procedures, and in procedural and interscorer reliability measures. Training occurred for the teachers, observers, and peer tutors involved in the study. Training sessions involved both teachers and observers. Training for the peer tutors was conducted in the classroom setting.

Training of Teachers

Training of teachers involved in this study was carried out through several workshops in which information related to strategy implementation and effective teaching behaviors was presented (see Appendix G). Training continued until teachers expressed comfort with the material. The researcher was the trainer for these sessions, demonstrating and modeling steps necessary for strategy implementation.

Training of Observers

One additional individual attended the training workshops. This individual along with the researcher observed to monitor procedural reliability throughout the study. She also received training in the forms used to record teacher behaviors (see Appendix K).

Training of Scorers for Reliability Checks

Two individuals served as independent scorers for error analysis of weekly dictation tests. Scorers were provided with 2 one-hour training sessions in error analysis of spelling samples (see Appendix F & J) (see discussion under

Interscorer Agreement section p. 94).

Training of Peer Tutors

Peer tutors were involved to facilitate individualization of the dictation tests. Their task was to administer a dictation test to a peer once each week. Students selected to function as peer tutors were originally to be good spellers as indicated by a *Test of Written Spelling* (Hammill & Larsen, 1986) those students who scored at or above the mean. After the first test was administered it became apparent to the researcher that poor spellers were embarassed to have good spellers see their errors. This was verbalized by the students who were then allowed to select their peer partner. No problems were observed after this change was made. All students received training in tutoring behaviors (see Appendix H) following training in the strategy. The classroom teacher and the researcher monitored the progress of the peer tutors throughout the study and retrained as was necessary.

Materials

All materials were experimenter made. The strategy script and cue cards (see Appendix D) were available for the instructors. All cue cards were copied as overhead transparencies to facilitate their use. The word list (see Appendix I) was included for use until the advanced practice stage of instruction (Henderson, Coulter, Templeton, & Thomas, 1985). These words were obtained from a sixth grade spelling text. This text was used because the scores obtained on the TWS-III indicated a higher level might be frustrating for the subjects.

Experimental Design

A single subject research design typically used in applied behavior analysis research (A-B-C) was used for this study because it provided a method for determining the existence of functional relationships, it is appropriate for use with special education research, and it was a research design that has been used frequently to investigate studies involving learning strategies interventions and spelling interventions with students who have learning disabilities.

Alberto and Troutman (1982) stated that a functional relationship can be assumed if the dependent variable shows a change when and only when the independent variable is introduced. Tawney and Gast (1984) agree with Alberto and Troutman's (1982) position stating: "To demonstrate a functional relationship means simply that the experimenter, teacher, and interventionist have confidence, through empirical verification, that behavior change occurred because the intervention occurred, and for no other reason." (p. 10)

In addition to demonstrating the existence of a functional relationship, a conceptual compatibility exists between special education practices and single subject designs (Strain, McConnell, & Cadisco, 1983). Both special education and single subject research focus on assessment of individual performance, careful specifications of interventions, and evaluation and decision making based upon student behavior. The use of repeated measures, a metric common to all single subject research, is a more accurate method of measuring subject learning than use of a single measure, a method more commonly associated with group designs (Haring, Lovitt, Eaton, & Hansen, 1978).

A review of the literature indicated that single subject designs are commonly employed in research concerning learning strategies interventions (Hughes, 1986; Lenz, Schumaker, Deshler, & Beals, 1984). Of the 36 studies reviewed (see Chapter 2) involving an intervention to improve the spelling performance of individuals with learning disabilities 18 were single subject designs.

In conclusion, single subject research was used in this study because this researcher wanted to determine if a functional relationship existed between the independent variable, a spelling word study strategy, and the dependent variable, spelling performance. For this research to contribute and not interfere with the ongoing instructional process in the classroom settings, there was a need to collect repeated measures in order to make data-based instructional decisions. Finally, many researchers investigating learning strategies interventions and spelling interventions have used a single subject research design.

The type of single subject research design that was used in this study was an A-B-C design (see Figure 2) (Tawney & Gast, 1984). The A-B-C design represents a variation of the A-B-A which is the simplest single subject research design for demonstrating a cause-effect relationship. The target behavior is continously measured under baseline (A), treatment (B), and post-treatment (C) conditions. After the dependent variable has stabilized during treatment conditions, the intervention is terminated and measurement continues during postintervention. In this study following intervention students were given a new word list, those words that had been misspelled previously in their free writing trials (see Appendix L). They were then instructed to use the spelling strategy with these words, and no further instruction in the strategy was conducted. The A-B-C design permits a functional analysis of behavior. Conclusions can be further substantiated when replications are conducted with additional subjects.

Variables

The independent variable for this investigation was the spelling word study strategy. Students were taught the word study strategy and monitored while using the strategy to determine memorization of strategy steps and correct use of the strategy while studying words. Students were monitored until mastery of 80% or greater was achieved on the weekly posttest. The dependent variables for this investigation included weekly dictation tests, tallying of the number of words written daily during seven-minutes of free writing, and the number of target words spelled correctly in these writing samples.

This study was divided into three phases: a baseline phase, an intervention phase, and a posttreatment phase (see Figure 2). Each of these phases will be described below.

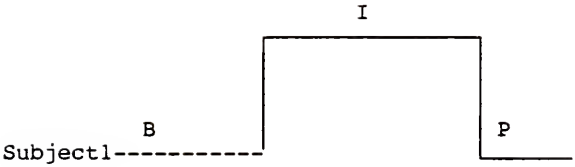
Baseline Phase

Baseline data collection began one to three days following screening and pre-testing. During the baseline phase, students were tested using the word list (Henderson, Coultur, Templeton, & Thomas, 1985) (see Appendix I). A posttest was conducted at the end of each week on ten words. No instruction in studying methods took place during the baseline condition. When a stable baseline with regard to three consecutive posttest measures was achieved for the subjects (N=10), intervention procedures were implemented. During the collection of baseline data, feedback was withheld from subjects.

During the baseline phase, data were collected on the number of words written during daily seven-minute writing samples. Additionally, the number of words that appeared on the weekly list which were spelled correctly in the writing were reported.

Intervention Phase

During the intervention phase, subjects were taught to study spelling words using the SPELL word study strategy.



----------=Independent variable not in contact with subjects

_________=Independent variable is in contact with subjects

| =Beginning of a new phase

B=Baseline phase

I=Intervention phase

P=Postintervention phase

Figure 2. Diagram of experimental design

The procedures were scripted for the teacher to follow throughout this phase. The procedures consisted of the teacher describing and modeling the study strategy. Students were required to verbally rehearse study steps until they received 100% accuracy on recitation of steps for three consecutive trials.

After mastery of study steps, subjects practiced applying the strategy during teacher monitored guided practice, and then practiced using the strategy on their own with minimal guidance (advanced practice). Subjects who demonstrated 80% accuracy on a minimum of three spelling probes (one per week) at the end of the advanced practice stage were considered ready for postintervention.

During this phase, data continued to be collected on the number of words written during the daily seven-minute writing period. The number of target words, words that appeared on the spelling lists, that appear in the writing samples continued to be reported.

Postintervention phase

After the subjects demonstrated mastery at applying the strategy, they received instruction in generalization procedures. Subjects during this phase used words identified by their instructors that were misspelled in their free writing samples (see Appendix L). The instructors read through students' previous writing samples and recorded misspelled words. These words became the word list for subjects during this phase of training. A minimum of two data points were collected at this phase to ascertain if students continued using the strategy and to determine if strategy use improved spelling in individual writing assignments. The number of words written during the writing sample and the number of target words spelled correctly were reported (see Chapter 4).

Data Analysis

The data collected were graphed and analyzed. Data were graphed for each individual to reveal individual variability (Tawney & Gast, 1984). This is done because treatment of group data may be problematic since variability across individuals may be masked when a group is treated as a single organism.

Visual analysis of the data was conducted because (a) it can be conducted with individuals and small group data, (b) it is a dynamic process with data being collected and analyzed throughout the research process, enabling data-based instructional changes; for example, changes may be made in the number of words presented to each student, (c) it permits the discovery of findings which may not be directly related to the research, and (d) since data are collected for each student, there is no over or under estimation of findings (Tawney & Gast, 1984).

To answer Question 1 regarding the percentage scores on the dictation test, a summary graph was developed representing all subjects' scores. Following the summary graph is a graph illustrating the median scores of all subjects dictation test and the high and low range scores. Each subject's individual scores are graphed separately.

To answer Questions 2 and 3 regarding the number of words written during seven minutes of free writing were counted and graphed, and the words that had been studied by subjects that reappeared spelled correctly in subsequent writing probes were identified and graphed. Further analysis of student performance was conducted following data collection. The writng probes of those subjects who demonstrated generalization of the studied words were re-examined to document the occurrences of the generalized words used in previous writing probes. This was done to disspell the reseacher's fears that the spelling strategy may have inhibited frequency of word usage.

Summary

A single subject design (A-B-C) was employed in this study to determine the effectiveness of the spelling word study strategy. Subjects were high school students with learning disabilities mainstreamed in regular English classrooms or served in a special education resource room. Measures to ensure procedural reliability were conducted throughout the study. Materials designed by the researcher were used. Data were graphed throughout the baseline, intervention, and postintervention phases of the study.

Visual analysis of the data was conducted.

In Chapter IV the results are presented, graphed, and analyzed. In Chapter V the discussion of the results follows with implications for classroom use and suggestions for future research.

CHAPTER IV
RESULTS

The purpose of this study was to determine what functional effect instruction in a spelling word study strategy had on learner spelling performance and generalization of the acquired skill. Ten subjects were taught the study strategy using a direct instruction format. Instruction was discontinued once subjects demonstrated mastery of skill steps. Mastery was demonstrated once subjects could name the strategy steps in sequence with 100% accuracy on three successive occasions.

To address the effect of training students in the study strategy, three research questions were posed. All questions were tested using a single subject A-B-C research design. In this chapter, the presentation of the data is organized to answer the research questions in the following manner: first the methods employed in analyzing the data are explained, and then the results are presented.

Analysis of the Data

For Question 1, which addresses the effect of the spelling study strategy on weekly dictation test scores, a summary graph of all ten subjects scores is provided. These data were then plotted demonstrating the median score with high and low range scores, and displayed in a table which illustrates the changes that occured within and between conditions. Finally the data for each individual subject are graphed.

For Question 2 the number of words written during seven minutes of free writing were graphed and visual analysis of the data was conducted to determine if the mastery of the word study strategy had increased the number of words written. For Question 3, to ascertain if any of the trained words studied occured spelled correctly in the written products, a second set of data points were included on the semi-logrythmic graphs that illustrate the number of words written. Additional data points have been added to represent the number of times that the trained words that were spelled correctly appeared misspelled in previous writing probes.

Question 1

The researcher wanted to ascertain if training in the Spell, word study strategy would increase the percentage of words spelled correctly. To answer Question 1 the data were analyzed in several ways. First all scores were reported on a summary graph (see Figure 3). This was done to illustrate the lack of overlap for all subjects between the baseline and intervention/postintervention phases. This graph clearly demonstrates the effects of the intervention on the spelling performance of the subjects. All subjects increased their

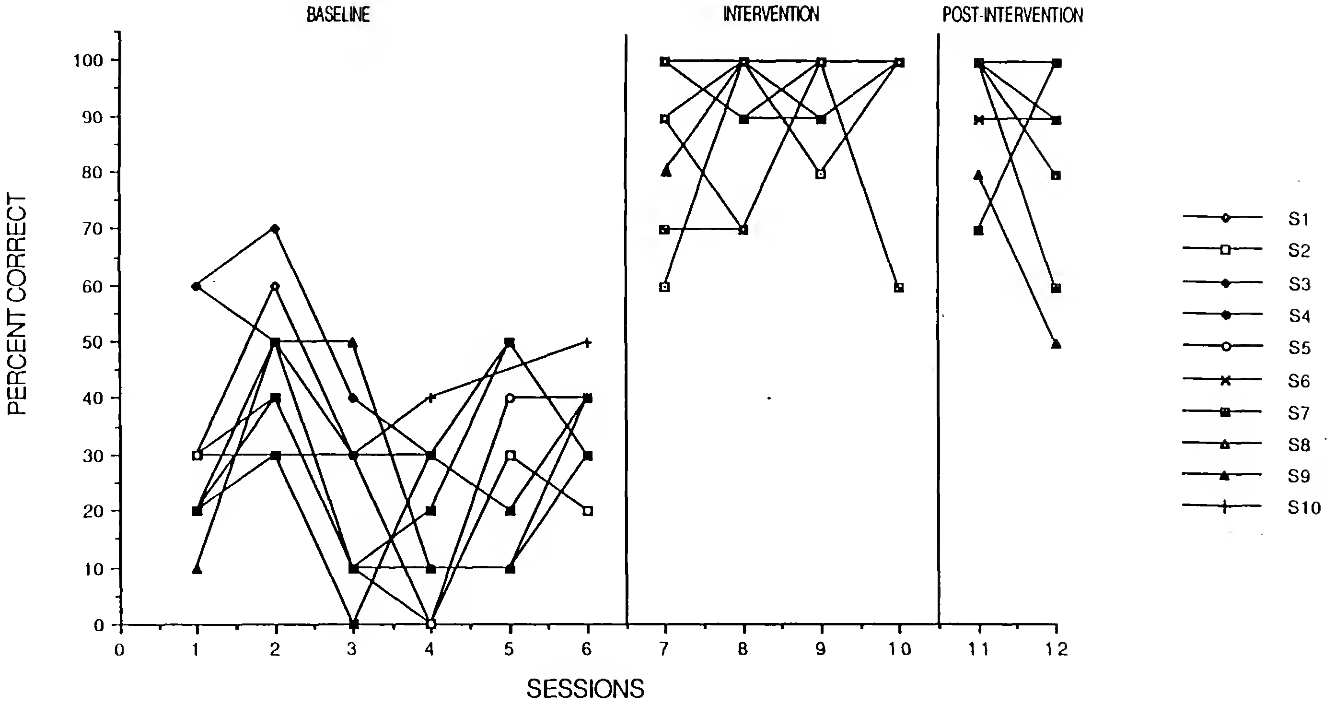


Figure 3. Summary graph of all subjects' dictation test scores

scores from the baseline to intervention /postintervention phases. The data are then graphed to represent the median score with the high and low range scores (see Figure 4). The median and high range scores are the same for all intervention and post-intervention scores except for session seven. This indicates that the majority of subjects are scoring at the 100% level following training in the study strategy. These data are then placed on a table that illustrates the changes within and between conditions (see Table 3). To enable further analysis of each subjects data scores have been graphed individually (see Figures 5-14).

Individual Data

Subject 1 achieved stability in the baseline condition. From the baseline condition to the intervention condition there was an increase of 60%. During the postintervention phase there was a slight decline in the score from the eleventh session to the twelfth session (100 to 80). The researcher feels this may be due to the twelfth session's date falling the day before spring vacation.

Subject 2 achieved stability throughout all phases of the study. The change that occurred between the baseline and the intervention condition was from 20 to 100 percent. No decline was evident for S2 during the final session in spite of the occurrence of spring vacation.

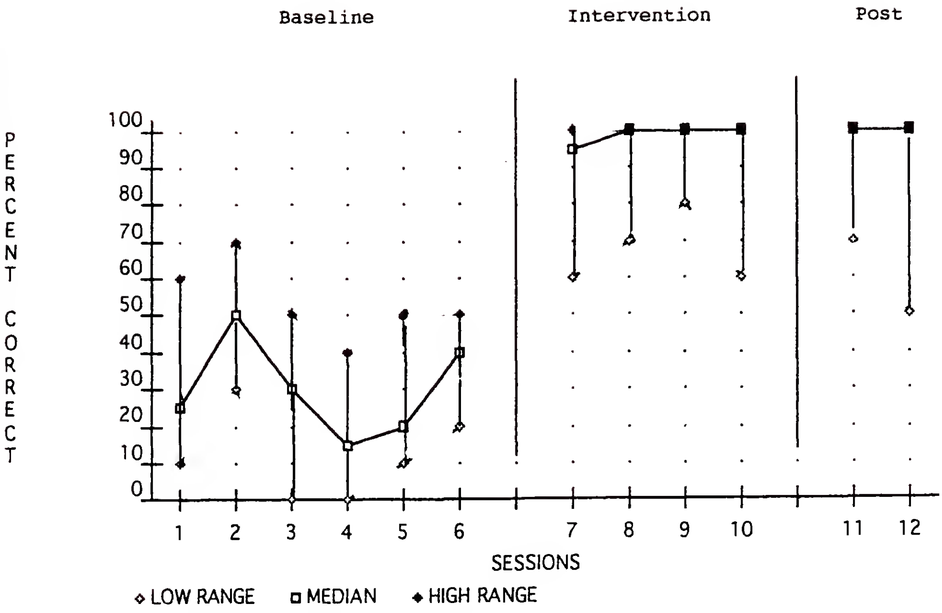


Figure 4. Median, high and low dictation test scores

Table 3. Changes of medians and ranges within and between conditions

WITHIN

	BASELINE		INTERVENTION		POSTINTERVENTION	
HIGH	60/50	-10	100/100	0	100/100	0
MEDIAN	25/40	+15	90/100	+10	100/100	0
LOW	10/20	+10	60/60	0	70/50	-20

BETWEEN

	BASELINE /INTERVENTION		INTERVENTION/POSTINTERVENTION	
HIGH	50/100	+50	100/100	0
MEDIAN	40/90	+50	100/100	0
LOW	20/60	+40	60/70	+10

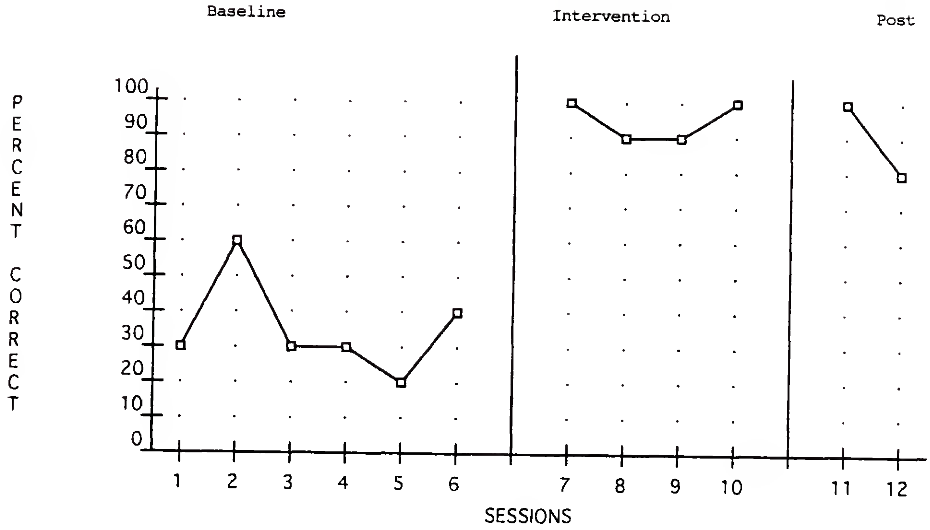


Figure 5. Subject 1 dictation test scores

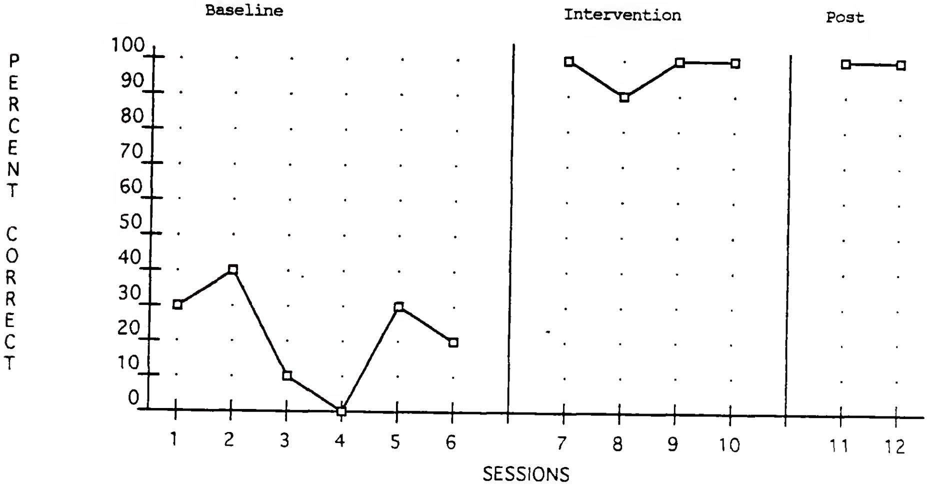


Figure 6. Subject 2 dictation test scores

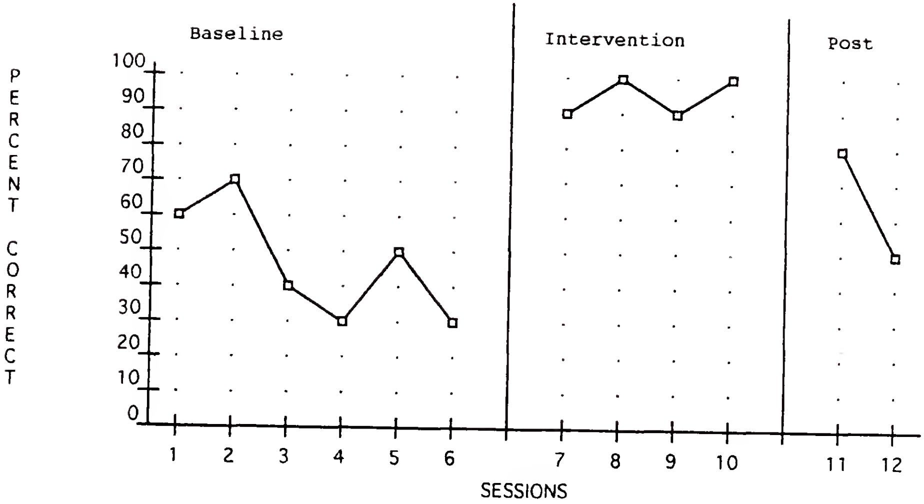


Figure 7. Subject 3 dictation test scores

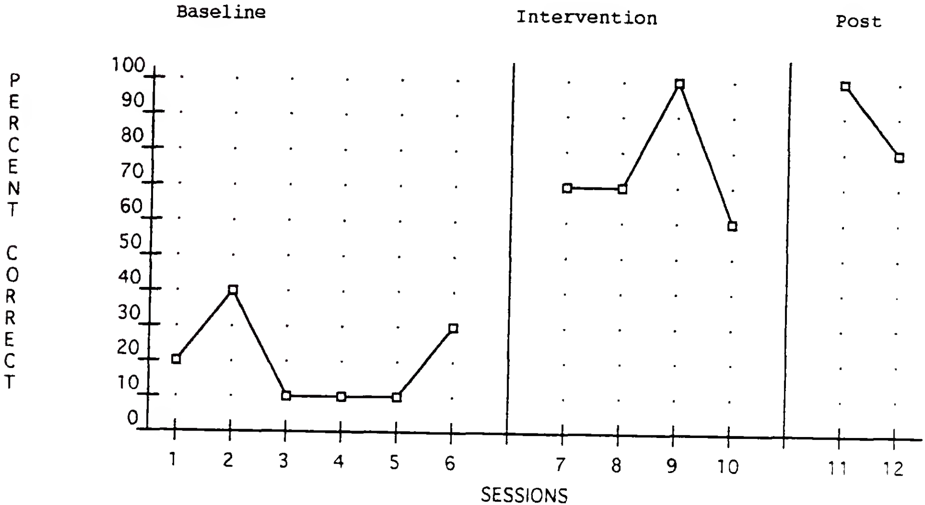


Figure 8. Subject 4 dictation test scores

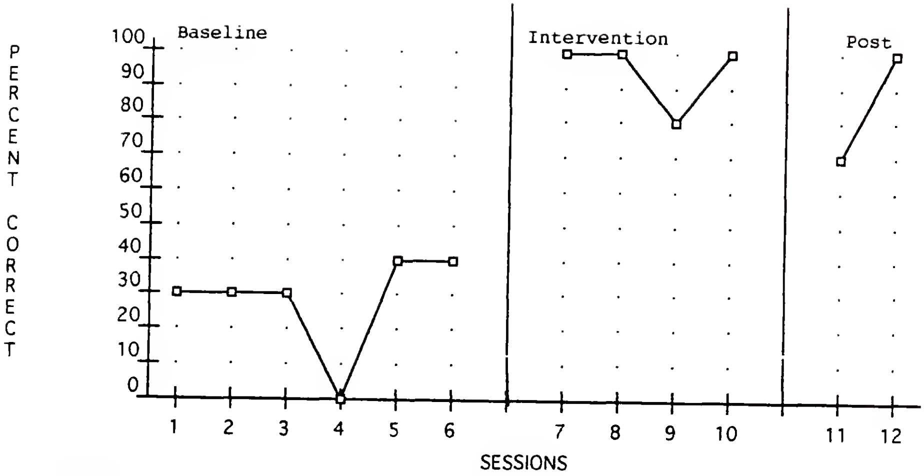


Figure 9. Subject 5 dictation test scores

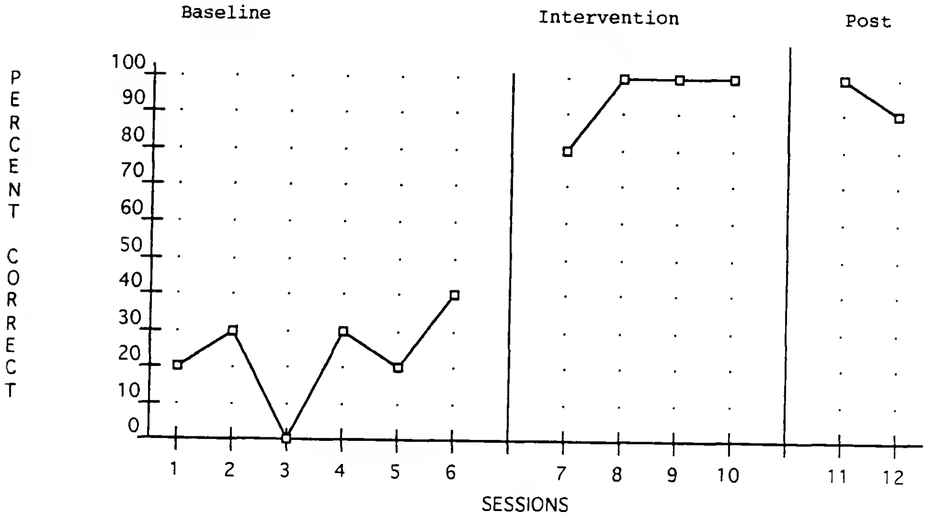


Figure 10. Subject 6 dictation test scores

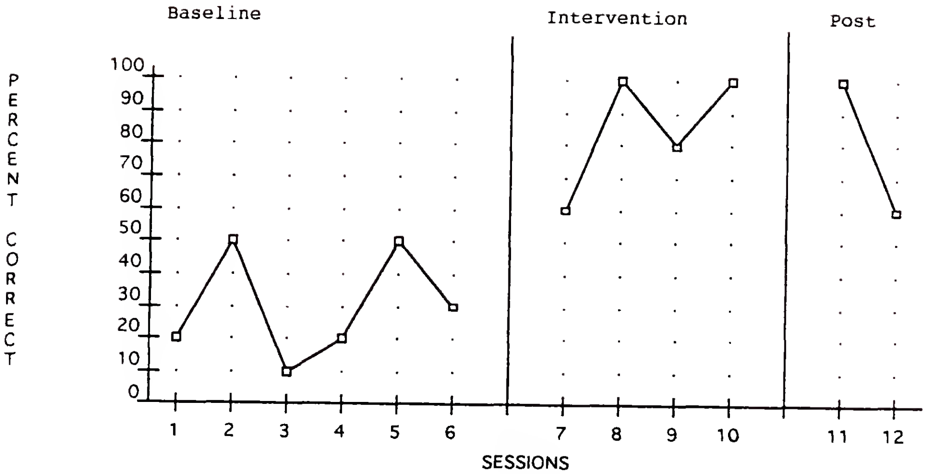


Figure 11. Subject 7 dictation test scores

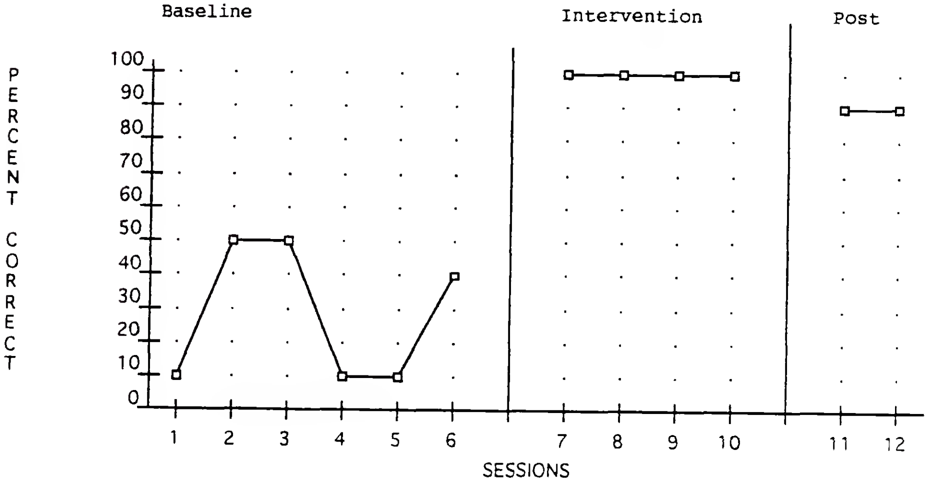


Figure 12. Subject 8 dictation test scores

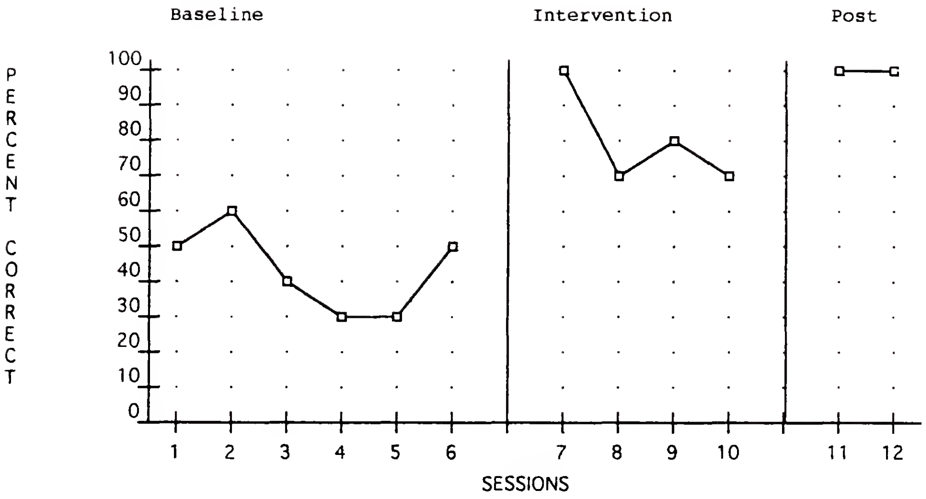


Figure 13. Subject 9 dictation test scores

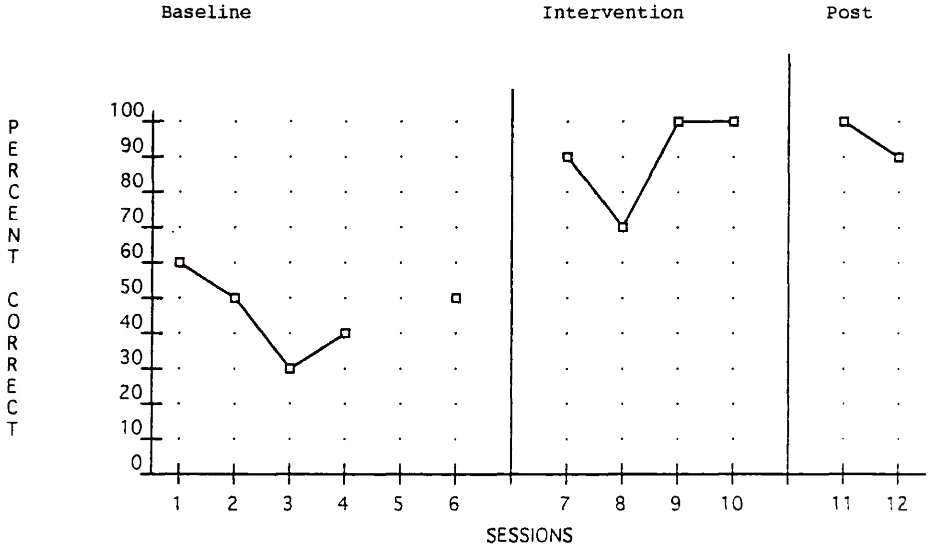


Figure 14. Subject 10 dictation test scores

Subject 3 had stability throughout all phases with increases during intervention and post intervention phases. This occurred across all sessions except the final session which may be due to the environmental factor of the session's proximity to spring vacation. The increase between baseline and intervention was 60 percentage points.

Subject 4 achieved stability across each phase of the research. The increase from the baseline to the intervention phase was 40 %. Subject 5 had an increase of 60% from the baseline to the intervention phase. Subject 6 had a 40% increase from baseline to the intervention. Subject 7 had a 30 % increase from baseline to intervention with a similar decline as subject 3 on the last session due most probably to the aforementioned environmental influence. Subject 8 had an increase of 60% from baseline to intervention while subject 9 had a 50% increase between those two phases. Subject 10 was absent on session 5 but stability was still demonstrated during the baseline phase and subsequent phases.

Question 2

The second question posed in this study was formulated based on the assumption that inability to spell significantly decreases the number of words written during timed writing opportunities. Thereby increases in words spelled correctly will increase the number of words written during the timed writing opportunities. Data to answer this question are graphed for each individual subject (see Figures 15-24). The variability between the numbers of words written for each seven minute writing opportunity was great for each subject. Great variability existed between and within each condition, and therefore there appears to be no correlation between the spelling strategy and an increase in the number of words written during seven minutes of free writing. The number of words written appears to be determined by what the subject had decided to write about; topics influence quantity.

Question 3

The data that answer this question are graphed on figures 15-24. The researcher wanted to identify those target words, words that had been studied, that were spelled correctly in the free writing probes. There was no evidence of this occurring in the baseline and intervention phases. During the postintervention phase, subjects were studying words that they had previously misspelled in their free writing probes. It was following studying words that had been attempted but misspelled that generalization occurred without prompting.

Generalization occurred for subjects 1,2,5,6,7,8, and 9. Subject 3 misplaced his free writing notebook, and therefore data was unavailable. Due to teacher and subject absences, subjects 4 and 10 had limited opportunities to write free writing probes during the postintervention phase.

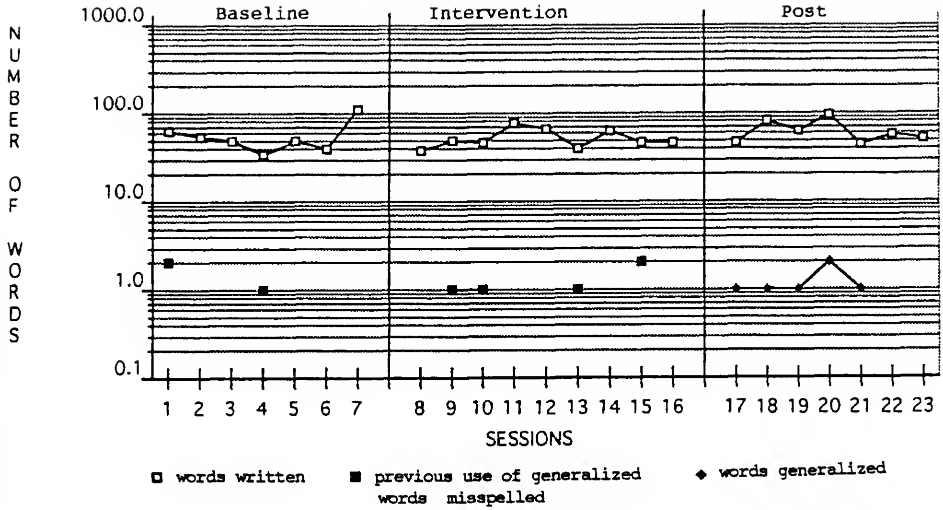


Figure 15. Subject 1 words written and generalized

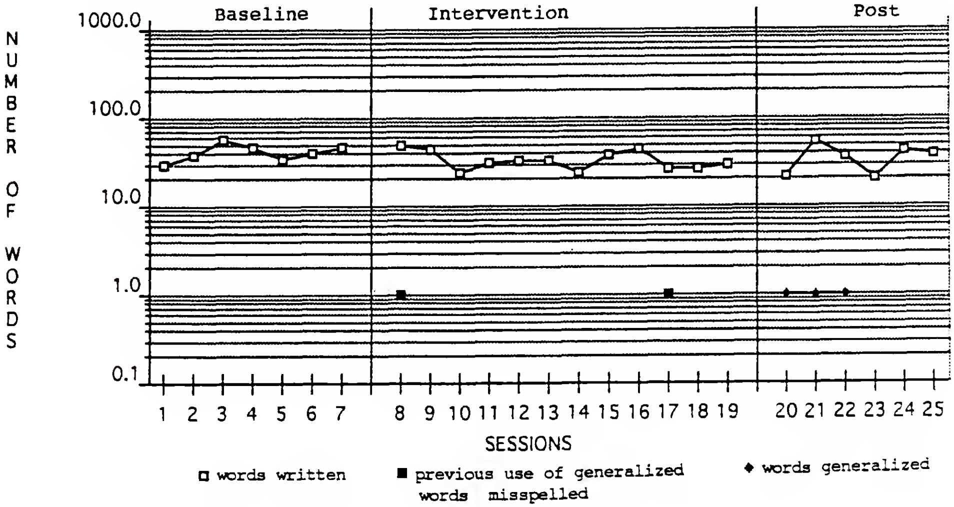


Figure 16. Subject 2 words written and generalized

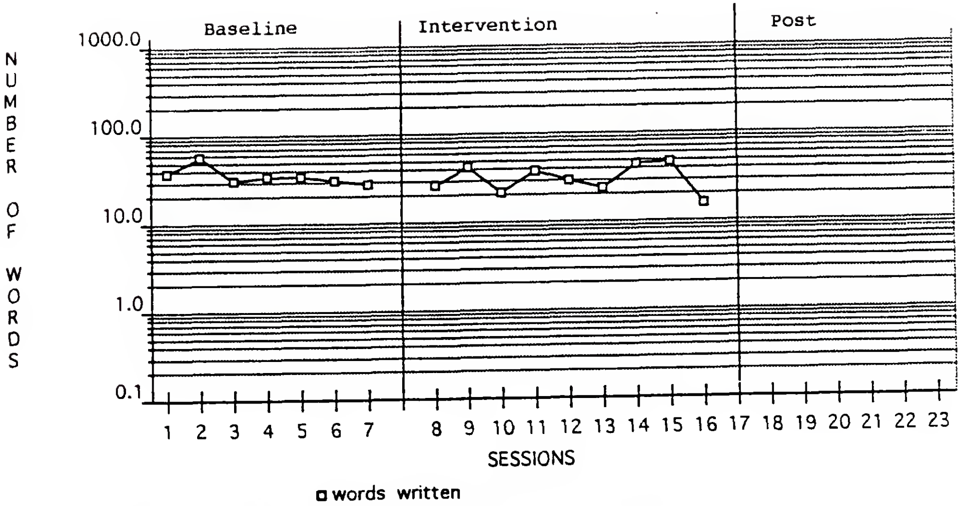


Figure 17. Subject 3 words written and generalized

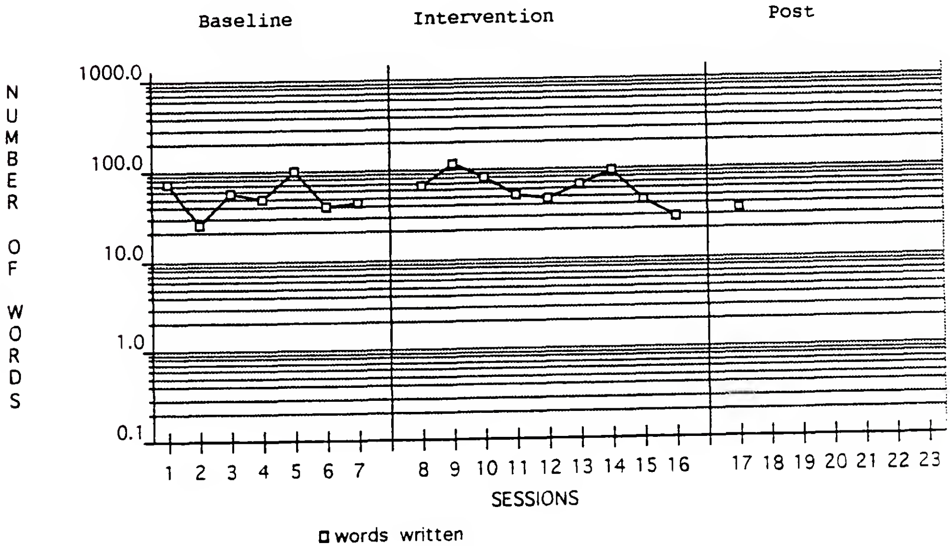


Figure 18. Subject 4 words written and generalized

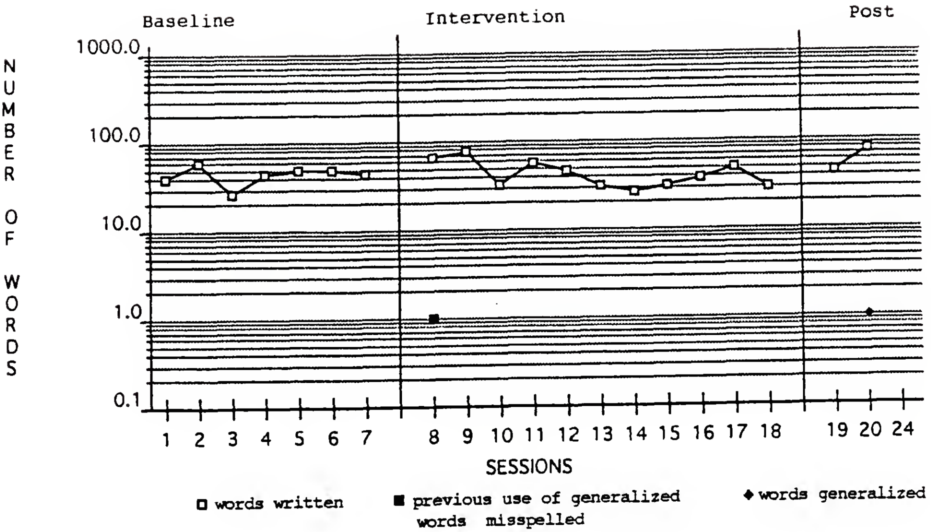


Figure 19. Subject 5 words written and generalized

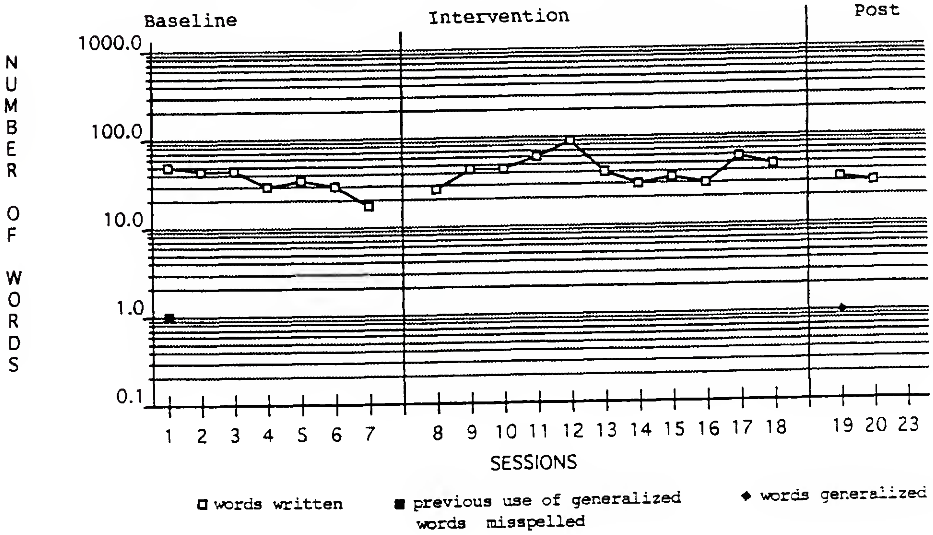


Figure 20. Subject 6 words written and generalized

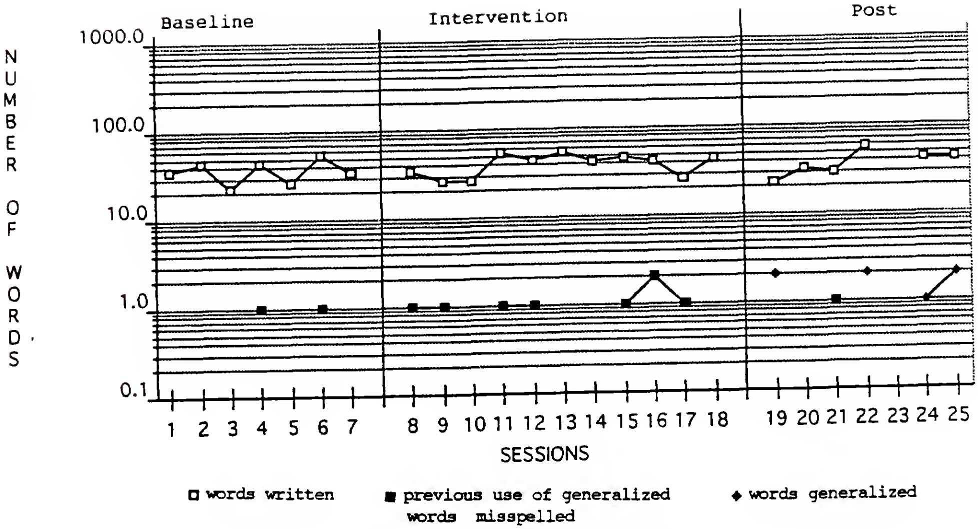


Figure 21. Subject 7 words written and generalized

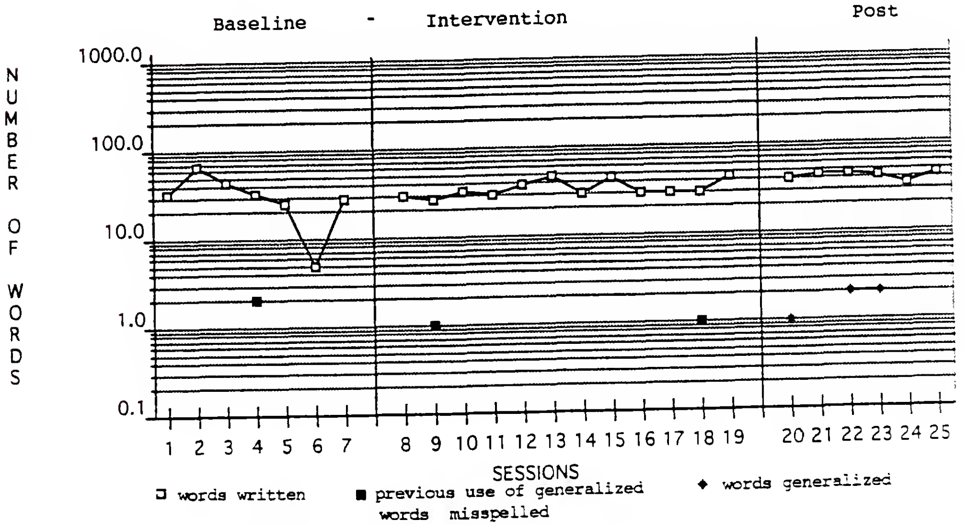


Figure 22. Subject 8 words written and generalized

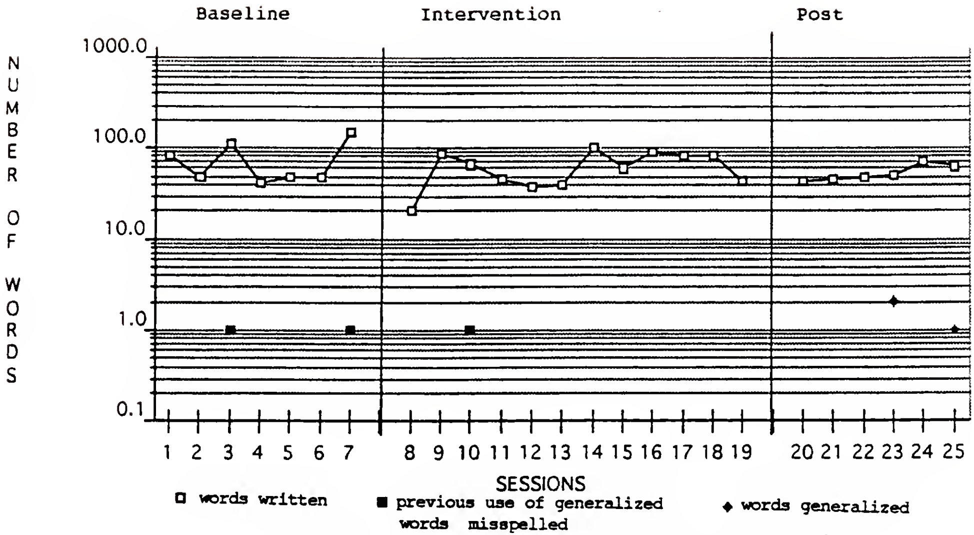


Figure 23. Subject 9 words written and generalized

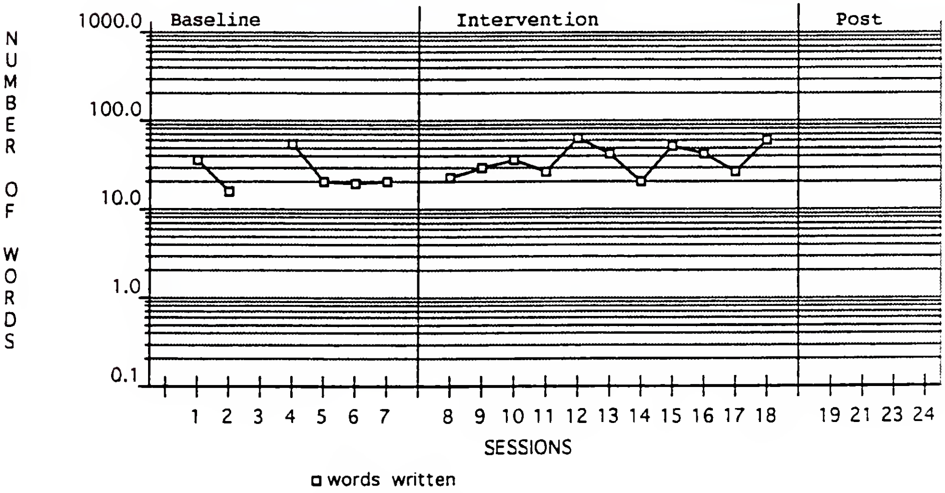


Figure 24. Subject 10 words written and generalized

To further analyze these data, the researcher wanted to determine if the frequency of word usage changed once the speller was spelling the word correctly. The occurrences of any target words, those words generalized during the post intervention phase, in the baseline or intervention phases were recorded. The occurrence of these words misspelled is graphed (see Figure 15-24). The target words were written incorrectly with similar frequency during the baseline and intervention phases as they were during the postintervention spelled correctly, thereby dispelling the concern that once students spelled the words correctly the frequency of use of that word would decline.

Summary

Results of this investigation show that students can be taught a means to study spelling words that is not time consuming and enables the student to spell the words correctly on a dictation test. There is some indication that these words that are studied do generalize to the subjects' free writing attempts, but not words from a published words list. Only those words that had been misspelled by subjects in earlier free writing probes and then studied by subjects were found to reoccur spelled correctly in subsequent writing attempts.

CHAPTER V
DISCUSSION

This chapter includes a discussion of the results of this investigation concerning the effects of instruction in a spell word study strategy on the spelling performance of ninth grade students with learning disabilities. To facilitate discussion this chapter is organized into three sections. In the first section the purpose of this study is restated, an overview of the literature is provided, and the methods are summarized. In the second section the three research questions are stated and the findings are discussed as they relate to the research literature. Finally in the third section limitations of this study are outlined, implications of the findings are discussed, and considerations for further research are outlined.

Purpose of the Study

Correct spelling is still considered an identifying factor of intellectual acuity by many in society. Although considerable emphasis is placed upon correct spelling at the secondary level, little if any instructional time is devoted to teaching spelling. Students are expected to spell accurately at this age, yet students with learning disabilities in written expression typically do not spell accurately. The present study represents an effort to illustrate that with little teacher time students can improve their spelling performance, and if words are used that students have misspelled during free writing opportunities these words may again occur in the free-writing samples spelled correctly.

Review of the Literature

Numerous studies have been conducted to investigate the effectiveness of a variety of instructional spelling strategies. From this research have emerged two primary theoretical stances. One faction maintains that English is primarily irregular. Supporters of this school of thought propose creating a synthetic alphabet or teaching each word as a whole word. Opposing theorists posit that English is patterned but incomplete. These researchers propose teaching spelling phonetically or instructing in linguistic rules.

Both theoretical schools have created a number of effective techniques. Among the effective techniques are using finite word lists (Ayres, 1950; Fitzgerald, 1951; Horn, 1926), testing students knowledge of target words prior to instructing students to study these words (Horn, 1947; Horn, 1976), analyzing student errors and providing feedback (Ganschow, 1984; Nelson, 1980; Silva & Yarborough, 1990), training in study strategies (Fernald, 1943; Fitzgerald, 1951; Horn, 1954; Westerman, 1971), and rule instruction (Horn, 1960; Templeton, 1980). Much of this effective research is not targeted for students with learning disabilities with only one percent of the research involving students with learning disabilities conducted in the area of spelling (Summers, 1986). Spelling difficulties are common for persons with mild disabilities, and have in some cases been identified as the performance factor differentiating the student with learning disabilities from other low achieving students (Deshler, Schumaker, Alley, Warner, & Clark, 1982).

The model of a spelling instructional strategy employed in this research was designed to encompass the research supported techniques of direct instruction in a study strategy, peer tutoring, using a word list, and the test study test method, and error analysis.

Methods

The research was conducted at Camden County High School in Kingsland, Georgia. Two different classroom settings were involved; one ninth grade English class composed of 10 students with mild disabilities, and two ninth grade English classes which were made up of 25 students with varying ability levels both of which contained mainstreamed students with learning disabilities. Ten subjects with scores on the TWS-3 one or more standard deviations below the mean were selected to participate in the study.

The dependent variables were weekly dictation tests and a tallying of words written during seven minutes of free writing. The dictation test was used to determine the effectiveness of strategy instruction. In the resource special education English classroom the teacher and the paraprofessional administered all individualized dictation tests. This was done because the teacher indicated that fellow students may not be able to read the words correctly. In the regular class peers tested each other. This worked very well with many of the students using their words in sentences in a way that their peer tutors would find amusing. While the students were testing each other the teacher circulated to ensure that the testing was being conducted properly. Throughout the study students were directed to write about a topic of their choosing. To prevent students from stating that they could not think of a topic, one was written on the board daily. The writing occurred for the first seven minutes of class time during all stages of the research.

The independent variable was training in a spelling word study strategy. Teachers were trained to implement the strategy and then used direct instructional methods to teach the spelling word study strategy to the students. Strategy acquisition was assessed by an experimenter designed instrument (see Appendix E).

To ensure reliability of procedures throughout the study interscorer agreement was calculated on the percent correct obtained on the dictation test and in the analysis of errors. Interrater agreement was calculated for trained observers' ratings of instructional sessions. All scorers and observers were trained prior to implementation of the study.

A single subject research design was used to evaluate the effect of the strategy on spelling performance. The subjects were tested across three conditions: baseline, intervention, and postintervention.

Review of the Questions and Results

In this section the three research questions are reviewed and summarized. The literature is reviewed and discussed as it relates to each question. Interpretations of the results are presented.

Question 1

The first question asked of the research was will training in the spelling strategy increase the percentage of words spelled correctly on the weekly spelling test? Each of the 10 subjects increased their performance from baseline to intervention and maintained that level of performance from intervention to postintervention phases. As evidenced by the summary graph of dictation scores (see Figure 3). There was very little overlap between the baseline and intervention/postintervention phases. Once students began to study the words they had previously misspelled during baseline testing, they had a median score of 90-100.

There was a slight decline in several of the subjects' scores during the last session (session 12). Subjects 1, 3, 4, 6, & 10 had declining scores on this session. The researcher feels that this was due to environmental influence. This session occurred on the Friday before students were released for spring holiday.

The implementation encompassed only five to ten minutes of classroom time daily. The use of peer tutors was extremely effective and increased students motivation to participate. During strategy use students were to write the words they were studying in a sentence. They peer tutors then read the word for the dictation test and then read the student's sentence to illustrate word usage. Many students became very creative and humorous in their sentence writing in an attempt to engage their peer tutors attention. Students were more than willing to participate in the strategy. Generally most students wanted to become better spellers.

Question 2

The second question asked of the data was will training in the spelling strategy increase the number of words written during seven minutes of free writing? The time for the writing probes was arrived at through a three day pilot of baseline data collection. It was difficult for these students to remain actively engaged in the writing process for ten consecutive minutes, so the time was reduced to seven minutes. Most all subjects demonstrated extreme variability throughout data collection with no apparent improvement from baseline through postintervention. Subject 9 demonstrated the greatest fluctuations; on one occasion writing as few as

20 words and on another writing 152 words. The topics that subjects decided to write about influenced the number of words written. For example there was a student killed during this study and following her death writing increased as students attempted to sort through their grief. During the postintervention phase no data was collected for S3. Without the instructor realizing, S3 removed his writing notebook from the class and then lost it. Limited data was collected from the students in the resource class (subjects 4,5,6,10) during this phase as well. This was due to absence of the teacher and a failure to communicate to the substitutes about the necessity of the daily writing assignments.

Question 3

The third question asked of the research was will training the spelling strategy increase the number of target words, words subjects have spelled correctly on the weekly tests, spelled correctly in the daily writing samples. During the baseline and the intervention phases there was no evidence of subjects using the words they were studying in their own writing. The researcher felt this may be due to the inapplicability of the words they were studying (see Appendix I). These words came from a spelling text (Henderson et al., 1985). During the final phase of the study the students were given words to study that they had previously misspelled in their free writing probes. Ten words were given to each subject at the beginning of each week, and they were told to use the study strategy on these words. It was at this point that students began using the words in their writing probes. These students were using these words spontaneously without prompting, and they were spelling them correctly. Generalization was identified in all subjects' writings except Subject 3, 4, and 10.

In attempt to demonstrate that students did not decrease the frequency of using these target words once they were spelling them correctly, the researcher tallied and graphed the use of the target words in previous writing probes. In no cases was the frequency of word usage greater during the baseline or intervention phases, and in all cases the words were misspelled.

Theoretical Implications of the Research

The spelling strategy was created in an attempt to present a model for implementation of a spelling program for students with learning disabilities at the secondary level. Components of this model as they relate to the research literature will be discussed.

This research adheres to the theoretical school that views English orthography as irregular, relying exclusively on presentation of the spelling word as a whole word. Hartman (1931) reported that good spellers were able to see the word as a whole better than poor spellers. Horn (1947) gave strength to this finding by comparing syllabication with a whole word presentation of spelling words. The whole word presentation was found to be superior.

The intervention employed in this research combined a number of components that have been identified as effective instructional techniques within the spelling research conducted with students who have learning disabilities. The most prominent component, in effect the backbone of the model, was the study strategy technique. Wong (1986) stated effective spelling instruction contains two components "knowledge of phonics and/or the linguistic structure of words and knowledge of spelling strategies" (p. 172). A review of the literature revealed ten studies that investigated the effectiveness of a spelling word study strategy with students who have learning disabilities (Beck et al., 1983; Bradley et al., 1981 a & b; Dangel, 1989; Foster & Torgesen, 1983; Graham & Freeman, 1985; Harris et al., 1988; Murphy et al., 1990; Pratt-Struthers et al., 1983; Wong, 1986). All studies found the use of a spelling word study strategy effective in improving spelling skill. The study strategy implemented in this investigation can also be considered effective as measured by dictation tests. The five steps in the strategy make it less cumbersome than more complicated strategies encompassing seven steps (Wong, 1986) or seventeen steps (Beck et al., 1983). There was no use of word segmentation as was found in Bradley's (1981) two experiments, relying heavily on whole word instruction. The use of the mnemonic SPELL to facilitate recall of study steps was an effective tool.

Another prominent component in this model of spelling instruction was the involvement of peer tutors in the application and maintenance of instruction. With the movement of the special education service model for students with mild disabilities from self-contained settings to inclusive or collaborative settings, and the need to individualize instruction for these students paramount, methods need to be developed to effectively maintain this level of instruction in these settings. Peer tutoring is an inexpensive and motivating means to accomplish this form of individualization.

Four studies were conducted that investigated the effects of peers as tutors in the spelling interventions of students with learning disabilities (Delquadri et al., 1983; Harper et al., 1991; Kohler & Green wood, 1990; Mandoli et al., 1982). All four studies increased student scores as measured by weekly spelling tests. An additional qualitative finding reported by the researchers was a high level of student engagement.

In this study peer tutoring functioned more effectively in the collaborative setting with students willingly working together, attempting to include their spelling words in sentences that their peer partner would find humorous which at times made the ten minutes of time required for all peers to test each other an uproarious occasion. The instructor in the resource setting was unable to allow all students to dictate words to each other due to the lower reading ability of some subjects, but the class size of ten and the presence of a paraprofessional kept the testing from becoming too time consuming.

A third lesser component of the spelling word study strategy was a variation of the error-imitation process described by Kauffman and colleagues (1978). Unlike Kauffman's research the subjects in this study did not see their errors modeled, but they were instructed by the strategy steps to notice how the word was misspelled previously and to compare this spelling with the correct spelling. Students were able to compare the two spellings because students were only presented with words they had previously misspelled. This was done in support of Horn's (1947) findings of the effectiveness of the test-study-test method.

Error analysis, another recommended technique (Ganschow, 1984; Nelson, 1980; Silva & Yarborough, 1990), was attempted at the onset of this investigation, but inconsistency of the analyses (see discussion in Chapter III under procedural reliability) led to abandonment of this aspect. The lack of consistency between the two scorers made the analyses invalid and the re-creation of the error analysis form (see Appendix J) and retraining of the instructors did not improve the consistency. The abandonment of this component in no way affected the integrity of this research. Additional research need to be conducted in this area.

Several measures were taken based on the research literature to ensure generalization. As with research conducted by Diaz, McLaughlin , and Williams (1990) students kept a file of index cards with each card representing a new word and the word written correctly in a sentence. These cards served as a reference for students and a tool in the dictation test process. Instructing students to generalize words was conducted as one of the instructional stages of this strategy based on findings from research conducted with students who have learning disabilities (Ellis, Lenz, & Sabornie, 1987). Finally, students did not begin to generalize trained words until the words that were being studied were those words misspelled in their writing probes (see Appendix L). This use of individualized word lists taken from students' writings was recommended by Fernald (1943).

Problems and Limitations

Certain characteristics of this study limit extrapolation and interpretation of results. For example, no conclusions should be made regarding the effectiveness of this strategy with other skill areas. Additionally the grade range, sample size, (N=10) and geographic location while appropriate for this design, were limited. Caution should be taken when attempting to generalize these results to other similar students. Furthermore, the strategy is a design encompassing many separate components., and it is not possible to factor out those which were effective and those which did not contribute to the effectiveness.

Implications

The implications of this study are numerous. At the classroom level there are implications for the English teacher at the secondary level who has an opportunity to work with mainstreamed students who have learning disabilities. There are additional implications for the researcher who is interested in effective ways to teach spelling at the secondary level.

Implications for the Classroom

The spelling word study strategy provides a means by which the secondary English teacher, who has a class composed of varying ability levels, can individualize a spelling program that does not involve undue instructional time. Spelling is a skill that needs to be improved at this level, but the secondary English curriculum which is composed of grammatical instruction paired with instruction in literature does not address this need. This strategy enables a teacher to instruct students for 2-3 30 minute sessions in strategy use, and then the students perform the strategy with peer assistance. There is only a need for the teacher to monitor the students' progress.

The students were motivated to continue using the strategy because of the involvement of peers and because of the increase in their dictation test scores. If generalization is to be achieved, the word lists need to be generated from the words that students are misspelling in their writing assignments.

Research Implications

Using the procedures implemented in this study , ninth grade students with learning disabilities were able to study words and spell them correctly on weekly dictation tests as well as use some of the words correctly in their writing probes. It remains to be ascertained which components of the strategy can be attributed with creating the effective results.

The error analysis component was not successful in this research attempt. Additional research needs to be conducted to design an effective error analysis protocol, and improved teacher training needs to be developed to increase the consistency of teacher error identification.

Future research needs to be conducted using only words that students have misspelled in their writing. The word list would then be completely individual and of a practical nature for each student.

Finally, research comparing the long-term effects of strategy instruction needs to be conducted in an attempt to determine if the number of words written will increase as a result of increased spelling proficiency over time.

Further Studies

This study investigated the ability of ninth grade students with learning disabilities to learn a spelling study strategy and apply this strategy on words that they had previously misspelled. To broaden the scope of these findings additional studies need to be conducted with other ages groups at the middle school and high school level.

It would be of value to investigate the effectiveness of the spelling strategy on poor spellers other than students with learning disabilities, for example with low achieving students or students with behavior disorders.

Finally, research conducted to determine if the generalized words are being spelled correctly after a considerable time lapse from the original dictation test would be beneficial.

APPENDIX A

INSTITUTIONAL REVIEW BOARD PERMISSION LETTER

UNIVERSITY OF
FLORIDA

Institutional Review Board

114 Psychology Bldg.
PO Box 112250
Gainesville, FL 32611-2250
Phone: (904) 392-0433
Fax: (904) 392-0433

January 30, 1995

TO: Ms. Beverly O. Brown
PO Box 435
Yulee, FL 32097

FROM: C. Michael Levy, Chair,
University of Florida Institutional
Review Board

SUBJECT: Approval of Project #94.608
The effects of a spelling word study strategy on the spelling performance of high school students with learning disabilities

I am pleased to advise you that the University of Florida Institutional Review Board has recommended the approval of this project. The Board concluded that your subjects will not be placed at risk in this research, and it is essential that you obtain legally effective informed consent from each participant's parent or legal guardian. When it is feasible, you should obtain signatures from both parents. This approval, however, is conditional upon your submitting to the IRB a copy of your approved parental informed consent form that includes the following phrase in the upper or lower margin: "Approved for use through January 30, 1996."

If you wish to make any changes in this protocol, you must disclose your plans before you implement them so that the Board can assess their impact on your project. In addition, you must report to the Board any unexpected complications arising from the project which affect your subjects.

If you have not completed this project by January 30, 1996, please telephone our office (392-0433) and we will tell you how to obtain a renewal.

By a copy of this memorandum, your Chair is reminded of the importance of being fully informed about the status of all projects involving human subjects in your department, and for reviewing these projects as often as necessary to insure that each project is being conducted in the manner approved by this memorandum.

CML/h2

cc: Vice President for Research
College Dean
P. Sindelar
Dr. Cecil Mercer

Unfunded

APPENDIX B

BOARD OF EDUCATION PERMISSION REQUEST

P.O. Box 435
Yulee, Fl 23097

January 17, 1995

Dr. Ann Proctor, Asst. Superintendent of Schools
Camden County Board Of Education
Kingsland, GA

Dear Dr. Proctor:

I am writing this letter to introduce myself and to ask permission to conduct an investigation entitled, **The Effects of a Spelling Word Study Strategy on the Spelling Performance of High School Students with Learning Disabilities**, in the Camden County school system. My name is Beverly Brown. I have been a teacher in special education at Camden County High School for the past three years. During this time I have still been involved in graduate studies at the University Of Florida. I will be working under direct supervision of Dr. Cecil Mercer, Professor, Department of Special Education.

The purpose of my investigation is to determine if training secondary students in a word study strategy will improve their spelling on spelling tests and in written products. Many students with learning disabilities at the secondary level continue to have problems with spelling and very little emphasis is placed on this instructional area.

There are a number of ways in which subjects may benefit from this investigation. Students may have written products with fewer spelling errors. Students who have hesitated to write because of the fear associated with having to spell may gain greater fluency in their writing ability.

This investigation will begin in January and conclude by April. Two collaborative English classes and one resource class at Camden County High School have been selected for inclusion in this study. The results of this study will be used to judge the effectiveness of the spelling word study strategy. Confidentiality will be maintained throughout the experiment.

Please contact me if you have any questions regarding this investigation. I can be reached during the day at (912)-729-7318 or after 5:00 P.M. at (904) 225-5804. Thank you for your cooperation.
Sincerely,

Beverly Brown

APPENDIX C

PARENT PERMISSION REQUEST

Dear Parents:

I am conducting an investigation of the effectiveness of a spelling word study strategy on the spelling performance of high school students. The purpose of this investigation is to determine if the spelling skill of students at the high school level can be improved by training in a few simple steps to improve word study. It is hoped that the information gained from this investigation will provide a simple and effective method for English teachers at the high school level to implement a spelling program.

Specifically I am asking for your permission to include your child in this study, as well as your permission to obtain information concerning reading achievement, spelling achievement, math achievement, and intellectual ability from your child's records. All students, whose parents give permission for inclusion in the study will be tested using a standardized measure of spelling achievement to determine the appropriateness of inclusion in this study. Students will then be tested weekly for approximately three weeks using a list of age appropriate spelling words. Instruction in the strategy will take two 30 minute sessions and then 5 to 10 minutes of their English class will be devoted to spelling each day for 2-3 months.

The results of this investigation will be used to determine the effectiveness of this strategy. Your child's name will not appear anywhere in the documentation in order to maintain confidentiality. Improvement in written expression is the final goal. Hopefully this will be observed following the training. If for any reason you wish to withdraw your child from this study, you may do so with no questions asked. Participation or non-participation will not affect your child's status in any class or program in which she/he is enrolled. If you have any questions please write or call Beverly Brown P.O. Box 435, Yulee, FL 32097, (904) 225-5804 (home) or (912) 729-7038 (work).

As a safeguard for your child and in order to comply with regulations established by the Camden County School system and the University of Florida, your permission is requested. Please fill out the bottom portion of the note and send it with your child to school tomorrow. Thank you for your cooperation.
Sincerely,

Beverly Brown

Approved for use through January, 1996

I have read and I understand the procedure described above and:

___I give permission for my child to participate in Beverly Brown's spelling word study strategy.
___I do **not** give permission for my child to participate in Beverly Brown's spelling word study strategy.
___I have several questions regarding this investigation and need more information. Please contact me at _________(phone#)._________

____
Child's Name

_________________ Parent/Guardian Signature _____ Date

_________________ 2nd Parent/Witness Signature _____ Date

APPENDIX D

STRATEGY SCRIPT AND CUE CARDS

SPELL-WORD STUDY STRATEGY

[Begin lesson 1 after student has taken the third dictation test on list words]

Lesson One: Obtaining commitment and describing the SPELL strategy.

Materials: Cue cards 1-6, pencil, paper, index cards, misspelled words for each student.

Advance Organizer:

What is one of the hardest parts of correcting your writing? [Elicit responses like, 'punctuation', 'coming up with what to say', 'spelling the words'.] **This is true, there are many steps to writing well all of which are important. We are going to focus right now on spelling.**

Why is correct spelling important in school? [Elicit responses like, 'if you don't, you'll get a failing grade','the teacher may think you don't care, etc.'].

Why would spelling be important when applying for a job? [Wait for responses,'they will think you are uneducated, or don't care about the job']. **Even when writing friendly letters, spelling is important; why is this?** [Wait for responses such as a girl/guy might think you are stupid]. **So you can see that spelling can effect many aspects of your life**

I have learned of a way to help you with your spelling. It is easy to learn and will only take a few minutes of your English class everyday. Would you like to learn a strategy for spelling words? [at this point obtain written commitment].

Great! I would like to teach you A strategy for studying words; what is a strategy? [wait for a response, say] **That's right a strategy is a plan or a set of steps to achieve a goal. What is a strategy?** [wait for a correct response] **For a strategy to be effective you must want to learn and use the strategy. You have all indicated your readiness for his strategy so we will begin today. I will begin by describing the strategy steps.**

Describe:

The name of the strategy is SPELL because it will be easy to remember the word SPELL when you need to study a word, and SPELL will give you the steps you need to take when studying. What is the name of the strategy? [wait for a response]. **Yes, the name of the strategy is SPELL** [show cue card 1].

The 'S' in SPELL stands for See the Word [show cue card 2]. When you see the word you: 1)see the whole word, 2) understand the shape of the word, and 3) notice how the letters fit together. What do you do when you see the word? [wait for a response]. Yes, you see the whole word, understand the shape of the word, notice how the letters fit together. [show cue card 1] There are three steps to remember during this stage. Can anyone suggest a way to remember them [elicit the mnemonic SUN]. That's right; sun gives you light to see things better.

The 'P' in SPELL stands for Pronounce and Write the Word [show cue card 3] When you pronounce and write the word you:1) say the word to yourself; if you are unsure, ask your peer editor, 2) write the word on your index card making sure to write it correctly, 3) identify the misspelled word and notice how the correct spelling is different, and 4) make the word fit in a sentence that you create on your index card. There are four steps to remember during this stage; that can be a lot! How do you think we can remember them [elicit the mnemonic SWIM]. That's right; good spelling will enable us to swim instead of sinking during or writing. What does SWIM stand for? [wait for a response]. The 'S' stands for say the word to yourself. The 'W' stands for write the word on an index card. The 'I' stands for identify the misspelled word and how the correct spelling is different. Then 'M", make the word fit in a sentence and write the sentence on a card. Great! swim helps us to remember what to do when we pronounce and write the word. So far all we must remember is SUN & SWIM. How can we remember this [elicit responses like you swim in the sun etc.] ? [show cue card 1]

The 'E' stands for Examine the Word. What does the 'E' stands for? [wait for response] That's right 'E' stands for examine the word. What does examine mean? [Elicit a response like 'look at', 'inspect', 'scan'] Very good! [show cue card 4] When examining the word, look at the word, close your eyes and try to picture the word on a large movie screen, imagine writing each letter, look at the word again to make sure you have written it correctly on the screen. What do you do when you examine the word? [wait for a response] Great! [show cue card 1]

The first 'L' in SPELL stands for Legibly Write the Word from Memory [show cue card 5]. Legibly is kind of a big word for writing carefully so someone can read your word. What does the first 'L' stand for? [wait for a response]. That's correct, legibly write the word from

memory; you guys are really learning this quickly [show cue card 1].

The last 'L' stands for Look to See if Your Word is Spelled Correctly. What does the final 'L'stand for? [wait for response] **That's right!** [show cue card 6] **You look to see if the word is spelled correctly, and if not you repeat the steps 1-4. You don't have to write the word on a new index card, but you can trace what you have written.**

[review each of the steps]

Now you have learned all of the steps of the SPELL word study strategy. You are ready to begin using the strategy. Tomorrow I will show you how to use the strategy.

[2nd day of instruction]

Lesson Two: Modeling the SPELL word study strategy

Materials: cue cards 1-7, pencil, paper

Advance Organizer:
Yesterday the Spell word study strategy was described for you. What does the 'S' stand for? [is correct say] That's right! [if incorrect] 'S' stands for see the word. What does 'P' stand for? What does 'E' stand for? What does the first 'L' stand for? What does the final 'L' stand for? [wait for each response and praise or correct as necessary]. Today I'm going to demonstrate how to use the strategy. I will be thinking aloud so you will know what is going on inside my head. I expect you to talk to yourself when you are using the strategy. I will pass out cue card 7 so you can follow along with me. Before I begin, are there any questions? [answer all questions] [direct students to look at cue card 7].

Well I received my spelling test back today, and I didn't do to well. My teacher says it's okay because now I know a new way to study words. She showed me the mistakes I made, and wrote the words correctly for me to study. Let's see I missed four of the twelve words. I missed 'their' and 'first' and 'interesting' and 'progress'.

We learned the study steps yesterday and the way you can remember them is the word 'SPELL'. I'm going to write SPELL at the top of my paper to help me remember to use each step. Well I'll begin with the word 'their'. The 'S' stands for see the word. That means to look at the whole word, notice the shape of the word, and to look at how the letters fit together. Well...I've looked at the word. I think I'm going to draw a box around the word to fit the shape. I had the shape right when I spelled it, but I got the 'e' and the 'i' mixed up. E comes first.

The next steps is 'P'........now 'P' stands for Pronounce and write the word. I remember there was a word to remember what to do during this steps, something like sink or swim.....that's it SWIM! Let's see.....the 'S' stands for say the word to yourself, that's easy. The 'W' stands for write the word on your index card. Okay t-h-e-i-r. 'I' stands for identify the correct spelling and how it differs from the misspelled word.....well I just mixed up the 'e' and the 'i', 'e' should come first. 'M' stands for make a sentence using he word. Okay "The boys in school wear their pants very low". Now 'E' stands for examine the word in your mind. I

think I need to close my eyes to do that. I can see a movie screen, I just went to the theatre last Thursday. I can see T-H-E (first)-I-R. Check to make sure I'm right. Good I got it all right. Now there are two 'L's in SPELL. The first stands for legibly write the word from memory. Legibly means to write so someone can read it. I have to be careful sometimes I get in a hurry. I must do this from memory so I will turn the card over [write 'their' on the overhead]. **The last 'L' means to look to see if the word is spelled correctly,**(compare the word written with the word on the card) **and it is so I don't have to go over it again.** [at this point take the word first and elicit student help to proceed through each of the steps]

Today you have seen how to use the spell strategy and have heard the kind of things you might say to yourself when using this strategy. You have done a fine job listening and using the strategy. Tomorrow we will practice saying the strategy steps until you can say them without any help.

[3rd day of instruction]

Lesson Three: Verbal Rehearsal of the SPELL word study strategy

Materials: cue cards 1-6, pencil, paper, verbal rehearsal checklist

Today you are going to memorize the steps of the word study strategy. If you know the steps and what to do at each step, then you will be able to tell yourself what to do when studying spelling words, and you will become a better speller.

To help you memorize the strategy steps we are going to do an exercise called rapid fire verbal rehearsal. This means you will be reviewing the strategy very fast, out loud. I will also be asking you to elaborate or describe what goes on at each step. You may use your cue cards if you need to, but don't rely on them. Try to remember the strategy, use the mnemonic SPELL and your memory to answer the questions.

I will begin by saying "S and pointing o a student who will then respond with "See the word" . Are there any questions? [at this point proceed with the verbal rehearsal. Use the verbal rehearsal checklist to test students individually. When a student has attained 100% accuracy on all strategy steps and elaborates on each steps, three consecutive times, you may discontinue verbal rehearsal.]

Great, you are making great progress in learning the strategy. We will continue this until you can recite the steps with no mistakes.

Lesson 4: Guided Practice with Feedback

Materials: Cue card 7, pencil, paper.

Today you are going to practice using the SPELL strategy with your spelling words (see Appendix I). [briefly review strategy steps] **Great you have really learned the steps needed to spell well. Now take the list of words you need to study and I will circulate to help you practice the study steps and use them.**

[continue guided practice until student receives 90% or better on a spelling test]

[Once students have achieved mastery with guided practice give students index cards and file box to keep their words. Monitor that the strategy is being used. If students achieve below 80% on weekly spelling tests, retrain in strategy steps]

Generalization Teaching Script

[1st day of generalization instruction]

Lesson 1:
You have spent a lot of time learning the SPELL word study strategy. You have done a great job and you can see how it has helped by the improvement on your spelling tests. You have been working with spelling words that are common words found in students' writings, but may not be the words you would select.

Let's review why we are learning this strategy [elicit responses like 'to spell better in our writing, 'on applications', 'letters' etc.]

At this point it is important for you to decide what words you need to study. I have taken your journal and circled the misspelled words. You will study three of these words each day for four days and on Friday your peer editors will test you over the twelve words. Your test will then be checked for to determine how many words you have spelled correctly.

You will be sure to use the strategy when studying the words, and the words that you add to your word file can be used when you are asked to write journals, compositions, letters, etc.

[generalization can be continued with any written work that may be expected of the student in any of their classes]

Cue Card 1

THE SPELLING STUDY STRATEGY

STEP 1: **S**EE THE WORD

STEP 2: **P**RONOUNCE AND WRITE THE WORD

STEP 3: **E**XAMINE THE WORD IN YOUR MIND

STEP 4: **L**EGIBLY WRITE THE WORD FROM MEMORY

STEP 5: **L**OOK TO MAKE SURE THE WORD IS SPELLED CORRECTLY

CUE CARD 2

SEE THE WORD

1. SEE THE WHOLE WORD
2. UNDERSTAND THE SHAPE OF THE WORD
3. NOTICE HOW THE LETTERS FIT TOGETHER

CUE CARD 3

PRONOUNCE AND WRITE THE WORD

SAY THE WORD TO YOURSELF(IF YOU ARE UNSURE ASK YOUR PEER EDITOR)

WRITE THE WORD ON AN INDEX CARD

IDENTIFY THE MISSPELLED WORD AND HOW THE CORRECT SPELLING IS DIFFERENT

MAKE THE WORD FIT IN A SENTENCE AND WRITE THE SENTENCE ON THE CARD

CUE CARD 4

EXAMINE THE WORD IN YOUR MIND

LOOK AT THE WORD

CLOSE YOUR EYES AND TRY TO PICTURE THE WORD ON A LARGE MOVIE SCREEN

CHECK TO SEE IF IT'S WRITTEN CORRECTLY

CUE CARD 5

LEGIBLY WRITE THE WORD FROM MEMORY

MAKE SURE YOU WRITE SO EVERYONE CAN READ YOUR WRITING

CUE CARD 6

LOOK TO SEE IF THE WORD IS SPELLED CORRECTLY

IF NOT REPEAT STEPS 1-4

CUE CARD 7

SPELLING TEST

1. FRIST FIRST
2. PAID
3. INTRESTING INTERESTING
4. SEEN
5. PRGRESS PROGRESS
6. CONTRACT
7. ADJUSTED
8. THIER THEIR
9. UNTIL
10. OCCUR
11. TREND
12. COMPARE

APPENDIX E

ASSESSMENT FORM TO OBTAIN ACQUISITION AND MAINTENANCE OF STRATEGY STEPS

NAME____________________

SPELLING WORD STUDY STRATEGY VERBAL PRACTICE CHECKLIST

NAMING STRATEGY STEPS AND COMPONENTS
ATTEMPTS

	1	2	3	4	5
SEE THE WORD	____	____	____	____	____
SEE THE WHOLE WORD	____	____	____	____	____
UNDERSTAND THE SHAPE OF THE WORD	____	____	____	____	____
NOTICE HOW THE LETTERS FIT TOGETHER	____	____	____	____	____
PRONOUNCE AND WRITE THE WORD	____	____	____	____	____
SAY THE WORD TO YOURSELF	____	____	____	____	____
WRITE THE WORD ON AN INDEX CARD	____	____	____	____	____
IDENTIFY THE MISSPELLED WORD	____	____	____	____	____
MAKE THE WORD FIT IN A SENTENCE AND WRITE	____	____	____	____	____
EXAMINE THE WORD IN YOUR MIND	____	____	____	____	____
LEGIBLY WRITE THE WORD FROM MEMORY	____	____	____	____	____
LOOK TO SEE IF THE WORD IS SPELLED CORRECTLY	____	____	____	____	____

APPENDIX F

OUTLINE FOR TRAINING OF SCORERS

TRAINING AGENDA FOR SCORERS

I. BRIEF INTRODUCTION

II. MODELING SCORING

III. GUIDED PRACTICE ON PRODUCTS

IV. EVALUATION

APPENDIX G

OUTLINE OF TRAINING FOR TEACHERS AND OBSERVERS

TRAINING AGENDA FOR TEACHERS AND OBSERVERS

I. INTRODUCTION

   A. THEORETICAL DEVELOPMENT
   B. SPELLING RESEARCH WITH LD
   C. RATIONALE FOR STRATEGY USE

II. DESCRIBE STRATEGY STEPS

III. MODEL STRATEGY USE

IV. OBSERVE TRAINEES MODELING STRATEGY

V. DESCRIBE ERROR ANALYSIS

VI. MODEL ERROR ANALYSIS

VII. GUIDED PRACTICE THROUGH ERROR ANALYSIS

VIII. EVALUATION

APPENDIX H

OUTLINE OF TRAINING FOR PEER TUTORS

TRAINING FOR PEER TUTORS

I. INTRODUCTION

II. DESCRIBE DICTATION TESTS

III. MODEL GIVING DICTATION TESTS

IV. PRACTICE WITH FEEDBACK

V. EVALUATE PERFORMANCE

APPENDIX I

WORD LIST

WORD LIST (Henderson, Coultur, Templeton, & Thomas, 1985)

depth
bomb
debt
strict
else
length
switch
theme
toast
frame
strain
league
throne
roam
myth
rhyme
pleasant
shy
thread
tying
annoy
vault
sprout
squawk
appoint
trout
earnest
churn
curb
earth
purse
chart
birch
iceberg
nowhere
headache
somebody
smallpox
grandchildren
Thanksgiving
brass
plumb
craft
pledge
prompt
grim
wreck
file
dome
grease
sleeve
gaze
preach
cleanse
grief
argue
rely
meadow
cycle
clause
bloom
foul
groove
gloom
roost
sought
skirt
fierce
pierce
yarn
whirl
urge
sword
carefree
forehead
birthplace
teammate
whereas
nevertheless
bundle
cliff
grill
plunge
witch
scrub
stung
brake
quote
strive
stove
soak
trait
pace
deny
leather
meant
syrup
brief
sweat
crouch
avoid
droop
hoist
mound
noun
naughty
thorn
snarl
starch
court
scorn
mourn
barefoot
fireproof
haircut
uproar
toothbrush
everlasting
heavyweight
mental

APPENDIX J

ERROR ANALYSIS CHECKLIST

Name ____________________ Scorer ____________________

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LANGUAGE/DIALECT																
	ENDINGS															
	INVENTED WORDS															
	DIALECT															
	SUBSTITUTIONS															
ORTHOGRAPHIC RULES																
	APOSTROPHES															
	DOUBLING FINAL CON.															
	CHANGING Y TO I															
	SILENT LETTERS															
	DROPPING SILENT E															
	PLACING I BEFORE E															
	USING CAPITAL LETTERS															
	FORMING PLURALS															
VISUAL MEMORY																
	HOMONYM CONFUSION															
	COMPOUND-WORD															
	SCHWA															
	SINGLE/DOUBLE CON.															
	SIBILANTS															
	REVERSALS															
	ADDED SYLLABLES															
	MISSING SYLLABLES															
	OMIS. DOUB. CONS.															
	ALTERNATE VOWEL															
	NONDECODABLE															
	NO ATTEMPT															
OTHER																

APPENDIX K

TEACHER BEHAVIORS RECORDING FORM

Name____________________ Observer____________________

		10	20	30	10	20	30	10	20	30
FOLLOWING SCRIPT										
FOLLOWING SEQUENCE										
FLUENT PACING										
USING MATERIALS CORRECTLY										
CORRECTIVE FEEDBACK										
		10	20	30	10	20	30	10	20	30
FOLLOWING SCRIPT										
FOLLOWING SEQUENCE										
FLUENT PACING										
USING MATERIALS CORRECTLY										
CORRECTIVE FEEDBACK										
		10	20	30	10	20	30	10	20	30
FOLLOWING SCRIPT										
FOLLOWING SEQUENCE										
FLUENT PACING										
USING MATERIALS CORRECTLY										
CORRECTIVE FEEDBACK										

APPENDIX L

INDIVIDUAL STUDENT GENERATED WORD LISTS

WORD LISTS FROM WRITING PROBES

S1

friends
they're
things*
really*
too
realize
Saturday
while
alcohol
Sunday
church
wrestling
vocabulary
stupid
acquaintances
also*
believe
decide
know
attitude

S2

party
dumb
police
pretty
different
told
one
senior
because*
wear
sling
faking
friend
yesterday
real
reason
rarely
always*
curious

S3

college
unpleasant
too
except
favorite
possessions
trophies
triumphant
excuses
superstitions
either
used
since
learned
pretzel
supposed
their
appealing
admire
really

S4

about
because
time
not
thinking
good
things
shot
else
beat
Jacksonville
a lot
whole
weekend
went
drove
saw
get
it's
they're

S5

believe
their
religion
it's
permit
tomorrow
sure
party
couple
another
come
today
Jacksonville
great*
there
stores
really
writing
now
mess

S6

slept
brother
went*
Waycross
waxed
riding
watched
third
they
again
honor
gives
difference
learned
experience
usually
common sense
anymore
shoot
can't

S7

write
tomorrow
fishing
friend's
secrets
training
pain
wear
boring*
pretty*
short
shirt
hospital
stupid
going
doesn't
probably
having
coming
a lot*

S8

Saturday*
buy
light
fence
a lot*
where
never*
favorite
predator
prey
reef
surgery
yourself
snorkel
might
wear
leave
everyone
shot
does

S9

relatively
skinny
wish
their
except*
receive
closest
need*
tried

S9 (cont.)

practically
wrapped
used*
laughed
saw
morning
licenses
where
their
funniest
supposed

S10

perfect
after
sadness
cousins
everyone
celebrate
giving
that's
something
piece
everything
being
Adidas
spent
forty
freshman
schedule
training
there
a lot

* words students wrote correctly in writing probes

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BIOGRAPHICAL SKETCH

Beverly Oviatt Brown was born the only child of Eugene and Patricia Oviatt, on April 16, 1963, in Jacksonville, Florida. Beverly did not graduate from high school, but instead entered Jacksonville University as an early admittant in 1979 following her sophomore year at Fernandina Beach High School.

In 1981 she married David Brown and in 1983 their first child, Isaac, was born. In 1985 she graduated with a B.A. in education from the University of North Florida and began teaching students with learning disabilities and emotional handicaps in a self-contained classroom setting at Fernandina beach High School. Their second child, Ida, was born this year.

In 1989, one month following the birth of their third child Hannah, Beverly entered the doctoral program at the University of Florida. She has taught all grade levels from kindergarten gifted students, to mildly handicapped high school students, including one year of teaching as a graduate assistant at the University of Florida. Beverly holds teacher certifications in the areas of gifted (K-12), emotional handicaps (K-12) and learning disabilities (K -12) in both the states of Florida and Georgia.

Beverly continues to enjoy teaching, recently completing her third year at Camden County High School in Kingsland, Georgia. In addition to teaching, she enjoys sailing, gardening, fishing, parenting, cooking, swimming, reading, and she looks forward to pursuing other hobbies not yet dreamed of.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philospohy.

Cecil D Mercer

Cecil Mercer, Chair
Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philospohy.

Mary Kay Dykes

MaryKay Dykes
Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philospohy.

Cynthia Griffin
Assistant Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philospohy.

James Joiner
Professor of Rehabilitation Counseling

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philospohy.

Hank Pennypacker
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philospohy.

Cary Reichard
Professor of Special Education

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 1995

Roderick J McDavis

Dean, College of Education

Dean, Graduate School

LD
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